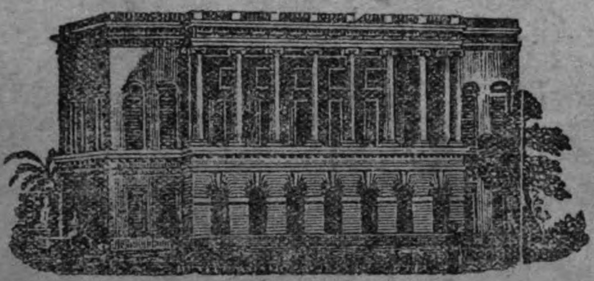
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सुश्रुतसंहिता ।

THE SUÇRUTA-SAMHITĀ

OR

THE HINDŪ SYSTEM OF MEDICINE ACCORDING TO SUÇRUTA.

TRANSLATED FROM THE ORIGINAL SANSKRIT

BY

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The present translation of the Suçruta Saṁhitā has been undertaken by me at the special request of the Council of the Asiatic Society of Bengal. The original translation, made by Dr. Udoy Chānd Dutt was stopped by the untimely death of the translator, after the publication of his second fasciculus. Its continuation by another translator proved so unsatisfactory that it had to be abandoned, after one more fasciculus. Dr. U. Ch. Dutt's translation, though a very fair performance, laboured under the disadvantage, owing to the translator's want of knowledge of Sanskrit, of not being made directly from the original language. It was also lacking all elucidation from the works of commentators. Both points are remedied in the present translation, which accordingly has been commenced *de novo*.

R. H.

Calcutta, 26th November, 1897.

TRANSLATION OF THE SUÇRUTA.

FIRST SECTION.

ON GENERAL PRINCIPLES.

(SŪTRA-STHĀNAM.)

THE FIRST CHAPTER.

ON THE ORIGIN OF MEDICAL SCIENCE (*āyurvēda*).

(1)[1] Salutation to Brahmā, Prajāpati, the Açvin-pair, Balabhid, Dhanvantari, Suçruta, and the rest![2]

In the following chapter I shall describe the origin of the Medical Science, even as the blessed Dhanvantari related it to Suçruta. [1]

(2) Once Aupadhēnava, Vaitaraṇa, Aurabhra, Pauṣkalāvata, Karavīrya, Gōpura-rakṣita, Suçruta, and the rest[3] (thus) addressed the blessed, immortal Divōdāsa, king of Kāçī, the

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[1] For the convenience of reference the translation has been divided into paragraphs. On the other hand, the numbers, inserted in the text within angular brackets, indicate the paragraphs into which the Sanskrit original is traditionally divided. The two commentaries referred to in the annotations are cited thus: BHĀ. = Bhānumatī, the commentary (*ṭīkā*) of Cakrapāṇidatta, and NI. = Nibandha-saṁgraha, the commentary of Ḍallana Ācārya.

[2] By *Prajāpati* is here meant Dakṣa, a son of Brahmā, and father of Durgā. His celebrated sacrifice is referred to in § 7. *Balabhid* or 'the Slayer of Bala' is an epithet of Indra. See below, § 8.

[3] There are seven pupils: and by "the rest" are meant such physicians as Bhōja and others. Others, however, take Gōpura

Dhanvantari or 'Great Surgeon,'[4] as he sat in his hermitage surrounded by a number of Rishis: "O Blessed One! our hearts are pained to see around us human beings suffering from the painful attacks of bodily, mental, adventitious and natural diseases (see § 10), (and to observe) how, helpless in the midst of friends, they are consumed in fruitless endeavours (after cures) and loudly lament (their fate.) With a view to the relief of the diseases of those health-seeking people and with a view to the preservation of our own life, for the sake of doing good to mankind, we have come here with a desire to hear (from you) a brief exposition of the Medical Science. That science is the basis of one's well-being both in this world and the next. Therefore we have approached you, Blessed One, as pupils."

(3) To them replied the Blessed One: "You are welcome, my sons; there can be no question about the fitness of any of you to receive instruction! [2] (Listen) then! What is called the Āyurvēda (or Medical Science), is one of the minor portions of the Atharva-vēda.[5] Svayambhū or 'the Self-existent One' (*i.e.*, Brahmā, see §§ 8, 16), before even he created

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and Rakṣita to be the separate names of two men, thus making eight pupils, to whom, for "the rest," they add Nimi, Kāŋkāyana, Gārgya, and Gālava, thus making a total of twelve pupils. So Ni., but Bhā. only gives the first alternative. In the Bower Manuscript, Part I (verse 8), there is a list of ten Rishis, who applied to *Kāçirāja* for instruction. But the only name common to both lists is Suçruta. Moreover in the Bower MS. Kāçirāja is the proper name of the Rishi, while in Suçruta it is an epithet ('king of Kāçi') of Divōdāsa, and the latter is identified with the mythical Dhanvantari (see note 4). In the first chapter of the Caraka, another long but quite different list of 51 medical Rishis is given.

[4] *Dhanvantari* is derived from *dhanu*, a synonym of *Çalya-çāstra* or 'surgery,' and *antari* or 'going across'; that is 'one who has mastered surgery.' So Ni. He is said to have been the physician, or rather the surgeon, of the Dēvas whose wounds he healed in their war with the Asuras. See § 8 and footnote 13.

[5] The Atharva-vēda consists of the following nine parts: the *vēda*, *vākya*, *itihāsa*, five *purāṇas*, and *vaidyaka* or 'medical science.' So Bhā.

men, composed it in a thousand chapters and a hundred thousand verses (*çlōka*). Afterwards in consideration of the short life and small intelligence of men he re-cast it into eight divisions. These are

(1) Çalya or major surgery,
(2) Çālākya or minor surgery,
(3) Kāya-cikitsā or the treatment of the body,
(4) Bhūta-vidyā or the science of demoniacal possession,
(5) Kaumāra-bhṛtya or the management of children,
(6) Agada-tantra or the doctrine of antidotes,
(7) Rasāyana-tantra or the doctrine of alterative tonics,
(8) Vājīkaraṇa-tantra or the doctrine of aphrodisiacs." [3]

(4) The following is a brief account of each of these (eight) divisions :—

The first called *Çalya*[6] treats of the extraction of extraneous substances (from the body), such as grass, wood, stones, sand, iron, earth, bones, hair, nails, pus, and (retained) secretions; also the foetus within the womb. It teaches also the use of blunt and cutting instruments, caustics and the actual cautery, and the diagnosis of inflammatory swellings. [4]

The second called *Çālākya*[7] treats of those diseases and their cures which have their seat in the ears, eyes, mouth, nose, or any other part of the body situated above the collar-bone. [5]

The third called *Kāya-cikitsā*[8] treats of those diseases and their cures which affect the whole body, such as fever, diarrhœa, hœmorrhage, consumption, insanity, epilepsy, skin-diseases, morbid secretion of urine, and others. [6]

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[6] *Çalya*, lit. means any pointed object.

[7] *Çālākya*, lit., surgery performed by means of a *çalākā* or 'pricker' or 'awl.' *Çalākā* properly signifies the *paṭala-vēdhanī*, i.e., 'the instrument for piercing the tunics of the eye.' Hence *çālākya* or *çalākā-tantra* properly means 'surgery of the eye'; but it is here used in a wider sense. So Bhā.

[8] *Kāya* is said, by Bhā. and Ni., to be a synonym of *agni* or 'digestion,' and for this Bhōja is quoted as an authority. Hence *kāya-cikitsā* would lit. be 'treatment of the digestion.' *Kāya*, however, as Ni. adds, also means the 'body'; hence *kāya-cikitsā*

The fourth called *Bhūta-vidyā* treats of the mental derangements due to being possessed by a Dēva, or a Gandharva, or a Yakṣa, or a Rakṣasa, or an ancestral spirit or a Piçāca, or a Nāga, and the like. It also teaches how to cure these *grahas* (or seizures) [9] by means of religious offerings and other conciliatory performances. [7]

The fifth called *Kaumāra-bhṛtya* treats of the management of infants, of the removal of defects in the milk of wet-nurses, and of the cure of diseases caused by bad milk or by demoniacal seizure.[9] [8]

The sixth called *Agada-tantra*, or the doctrine of antidotes, treats of the diagnosis of the poisonous bite of snakes, insects, spiders, scorpions, mice, etc. It also teaches how to cure people suffering from any of these various poisons, or from poisoning due to an (unsuitable) combination (of food). [10] [9]

The seventh called *Rasāyana-tantra* or the doctrine of alterative tonics, treats of those medicines which preserve youth, promote (length of) life, intelligence, and strength, and give power to resist diseases. [10]

The eighth called *Vājīkaraṇa-tantra* [11] or the doctrine of aphrodisiacs, treats of remedies for the implenishing, restoring,

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means 'the treatment of the body.' Practically there is no difference.

[9] The number of these *graha* or seizures, is said to be eight. They are all due to various kinds of supernatural beings: *viz.*, (1) *dēva* or gods ('angels'); (2) *asura* or *daitya* or enemies of the dēvas ('devils'); (3) *gandharva* or heavenly minstrels; (4) *yakṣa* or guardians of hidden treasure; (5) *rakṣasa* or monsters (such as the ten-headed Ravaṇa); (6) *pitṛi* or spirits of departed ancestors; (7) *piçāca* or flesh-eating demons; (8) *nāga* or beings in serpent form. There exists also another class of *graha*, viz., the *bāla-graha* or 'demoniacal seizures affecting children.' They will be found enumerated below in chapter 3, § 8. They belong to the fifth division or the *kaumāra-bhṛtya*.

[10] The combined materials, by themselves, may be innocuous. Thus Ni. instances the combination of honey and clarified butter.

[11] The term *vājīkaraṇa* is variously explained. *Vājī* means 'strong,' 'impetuous'; hence *vājī-karaṇa* is a 'means of making

revigorating and recreating respectively of scanty, diseased, dried up, or wasted semen.[12] It also teaches how sexual desire may be stimulated. [11]

Such are the eight divisions of Medical Science.

(5) "Now, whom (of you) shall I instruct, and in which of these subjects?" They replied: "Teach all of us, Blessed One, beginning with the very first, the knowledge of *Çalya* or 'major surgery'." He said: "Be it so!" They again said: "Blessed One, seeing that we hold all the same opinion, Suçruta will put our questions to you, and while you are instructing him, we (others) will listen with attention." He replied: "Be it so!"

(6) ("Listen) then, Suçruta, my son! the object of the *Āyur-vēda* or 'Medical Science' is the restoration of those who are afflicted with diseases, and the preservation of the others in sound health. [12] *Āyuḥ* means 'life' and *vēda* means 'to know' or 'to attain.' Hence *āyur-vēda* is that science which is concerned with the nature of life and with the means of preserving it. On the first division of it I shall now instruct you in conformity with the sacred scriptures and with (the results of) observation, inference and analogy. Listen attentively!" [13]

(7) This division takes the first place, because the first (application of the healing art) was on the occasion of the healing of the wounds inflicted (in the assault on the sacrifice) and of the restoration of the head of the sacrificial animal.[13] For

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(sexually) potent.' But *vājī* means also a 'horse'; hence *vājī-karaṇa* is a 'means of making one like a horse' (in sexual potency). The latter is the usual traditional interpretation already given by Caraka. Both the above interpretations are given by BHĀ. and NI. The latter, however, adds a third, which makes *vājī* to be a synonym of *çukra* or 'semen'; hence *vājī-karaṇa* is a 'means of producing semen.'

[12] 'Scanty semen' refers to natural deficiency in youth under twenty-five, 'wasted semen' to deficiency due to excesses in middle life, 'dried-up semen,' to deficiency due to old age. 'Diseased semen' is due to diseases, and may occur at any age. So BHĀ and NI.

[13] The reference is to the celebrated sacrifice of Dakṣa. The commentaries (BHĀ., NI.) take this passage to contain refer-

it is related, that when Rudra had cut off the head of the sacrifice, the Dēvas approaching the Açvin-pair said to them: "Blessed Ones, you twins are admittedly the most excellent amongst us. It is you who must restore the head of the sacrifice." The twins replied: "So be it!" Then for their sake the Dēvas gratified Indra with a share of the sacrifice; and they restored the head of the sacrifice. [14] Moreover among the eight subjects treated of in medical science that (which concerns major surgery) is the foremost, on account of its doing its work quickly, because it must be done by the application of blunt instruments, sharp instruments, caustics, and actual cautery, and on account of its being equal (in value) to all (the other)

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ences to two distinct occurrences: (1) the great war of the Asuras with the Dēvas for the possession of heaven, (2) Dakṣa's sacrifice. But the context, which enters only into the details of the second ccurrence, renders this explanation improbable. The sacrifice of Dakṣa is related with some minor variations in the Mahābhārata and other works. The main story is that Dakṣa invited all the gods with the exception of his son-in-law Çiva or Rudra, who, in revenge, violently interrupted the sacrifice. He created a monster Virabhadra, who decapitated *yajña* or 'the sacrificial animal' (a deer), and wounded and maimed most of the guests. Finally Çiva was pacified by being given a share in the sacrifice, whereupon he restored all the injuries done in the encounter. According to some accounts, Dakṣa himself was decapitated, and as his head had fallen into the sacrificial fire, it was replaced by Çiva with a goat's head. All these accounts know nothing of any intervention of the Açvins as healers. This seems to be an imbellishment of the medical çastras, according to whom the Açvins were induced to undertake the restoration by a share of the sacrifice being allowed to Indra, who was their pupil (see § 8). The introduction of Indra is hardly sufficiently accounted for: one would rather expect the Açvins themselves to be gratified with a share in the sacrifice: moreover, one would expect the twins as well as Indra (all being dēvas) to be among the original guests and participators. The version of the story in the Mahābhārata seems to have more consistency, which, however, in stories of this kind is perhaps not to be expected. Or may it be suggested that *Indra* is an ancient misreading for *Rudra*?

subjects (put together).[14] Hence it is a means of attaining salvation, religious merit, heaven, fame, longevity, and a competency. [15]

(8) Brahmā was the first to promulgate (the science of medicine); from him Prajāpati (*i.e.*, Dakṣa) learned it; from him again the Açvin-pair; from the Açvins Indra; from Indra myself; and my duty it is (now), for the good of mankind, to communicate it here (in this world) to all who desire (to receive) it. [16] On this point there is (the following verse):—

> It was I, Dhanvantari, the primeval Deva,[15] that removed decrepitude, disease, and death from the Immortals (*i.e.*, the Dēvas); and now I have appeared on the earth, in order to teach here surgery as well as the other branches of medical science. [17]

(9) In this science by that aggregate, the animated body composed of the five elements,[16] is understood the *puruṣa* or 'the

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[14] Commentaries: "unless surgical work is done quickly, the patient suffers injury." The translation, above given, gives two reasons for the excellence of surgery; the passage, however, (as the commentaries point out) may also imply three reasons: "on account (1) of its doing its works (*viz.*, incisions, etc.) quickly, (2) of its employing instruments, etc., (3) of its being of equal value to the rest, because, as BHĀ. explains it enters into the subjects of all the rest. Both BHĀ. and NI. make mention of another recension of this passage, which simply reads *adhika-kriyā-karaṇāt* i.e., 'on account of its doing more work (than the rest),' instead of *āçu-kriyā-karaṇād=yantra ...... sāmānyāc=ca*. Both add that, even with this reading, the two clauses *yantra-çastra-kṣār-āgni-praṇidhānāt* and *sarva-tantra-sāmānyāt* must be understood as being implied, as giving the reasons for surgery doing more work than the rest.

[15] The *ādi-dēva* or 'primeval dēvas' are Brahmā, etc., as contrasted with the *karma-dēva* or 'those who owe their divinity to their extraordinary feats,' such as Indra and others, and with the *prayōjana-dēva* or 'those who owe their divinity to some necessity' such as Buddha, Skanda and others. So the Commentaries.

[16] The five *mahā-bhūta* or 'elements' are: earth, water, fire, air, and *ākāça* (or ether).

human being.' It is he (alone) to whom medical acts[17] refer, (and) he (alone) is the subject (of my discourse). Why? Because the world consists of two classes of beings. For the world is divisible into these two, the *sthāvara* or 'those that cannot move' and the *jaŋgama* or 'those that can move.'[18]

It may be added incidentally that (from the point of view of fitness for medicinal use) the world is also divisible into the two classes of the calorific and the frigorific; or, having regard to its great variety, it may be divided into five classes.[19] [18]

Now the (*jaŋgama*, considered as) *bhūta* (*i.e.*, from the point of view of *bhūti* or 'the manner of their birth') are divisible into four classes, namely those respectively termed *svēda-ja* or 'produced from warm moisture' *aṇḍa-ja* or 'produced from an egg,' *udbhij-ja* or 'produced from a split in the earth,' and *jarāyu-ja* or 'produced from the womb.' Among these the *puruṣa* or 'the human being' is the chief, because the others are intended for his service. Hence it is the *puruṣa* or 'the human being,' who forms the subject (of my discourse.)[20] [19]

(10) Any occurrence which causes him pain is termed a *vyādhi* or 'disease.' These (diseases) may be of four kinds: adventitious, bodily, mental, and natural. Of these the adventitious

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17 Such as the administration of medicines, and the application of instruments, caustics, bougies, etc. (Commentaries).

18 On the details of this classification, see below § 12.

19 According as one or the other of the five elements (see footnote 16) predominates in their composition.

20 The argument runs continuously through paragraphs 18 and 19 of the Sanskrit text. It is briefly this: the world is divisible into two classes, the stationary and locomotive. The latter class, which includes men, is subject to states of disease and health. Yet medical science concerns itself only with the human being. Why? Because man is the chief, all other living beings being subservient to him. This is clearly explained in BHĀ. But NI. does not seem to have grasped the argument quite accurately. In paragraph 18 it takes *puruṣa* to mean 'a sentient being,' including both men and *paçu* or 'animals,' while in paragraph 19 it takes *puruṣa* as restricted to the human being.

are injuries caused by violent contact.[21] Bodily diseases are caused by any derangement[22] of the air, or bile, or phlegm, or blood, or of all these (humours) combined, brought on by (irregularities in) food and drink. Mental diseases, showing themselves in the form of anger, grief, fear, joy, disappointment, envy, proneness to detraction, despondency, unfriendliness, lust, avarice, and such-like dispositions, are the result either of (violent) desire or (violent) aversion. Natural diseases consist in (a perversion of) the natural states of hunger, thirst, old age, death, and sleep. All these diseases have their seat in the body and in the mind.[23] [20]

(11) Depuratory and rectificatory remedies, observances regarding food, and corrective practices, properly employed, are the means for checking diseases.[24] [21]

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[21] Such as those produced by weapons, supernatural beings, poison, fire, wind, etc. (Commentaries). *Āgantu* lit. means 'arriving,' 'adventitious,' therefore a 'disease coming from the outside,' *i.e.*, 'caused by injurious contact with some external body.'

[22] That is: derangement of the proper proportion of the humours, either through excess or deficiency. (Commentaries).

[23] That is: either in the body (as fever), or in the mind (as wrath), or in both (as epilepsy). Besides, a disease affects the body first, and the mind afterwards, or *vice versa*. So the Commentaries.

[24] Depuratories are external or internal. The external are instruments, caustics, plasters, etc.; the internal are emetics, purgatives, enemas, errhines, and blood-letting. Rectificatories also are either external or internal. The former are liniments, douches, baths, unguents, applications to the head, liquid and semi-liquid gargles, etc. The latter are digestives, attenuants, nutrients, tonics, aphrodisiacs, antitoxics, etc. Food is of four kinds (having regard to the mode of consumption): what can be drunk, licked, swallowed, and masticated; or of three kinds (from the point of view of its effect): relieving deranged humours, curing diseases, and giving health and sustenance. Corrective practices have reference to the body or the voice or the mind. Bodily exercises are, according to BHĀ., walking, copulating, dancing, etc., according to NI., fasts, abstinences, etc. Vocal exercises are reading, singing, re-

(12) Now food is the sustenance of living beings and (the source) of their strength, colour, and vital power. (In order to be such) it depends on the six tastes; and these again exist in the material objects. But the material objects (also) serve as *ōṣadhi* or 'medicaments'; and the latter are of two kinds: *sthāvara* or 'stationary,' and *jaŋgama* or 'locomotive.' Of these the stationary ones are of four kinds; namely, *vanaspati* or 'trees that bear fruit but have no flowers,' *vṛkṣa* or 'trees that bear both fruit and flowers,' *vīrudh* or 'plants that grow in the form of a creeper or a shrub,' and *ōṣadhi* or 'plants that die after maturing their fruit.'[25] [22] The *jaŋgama* or 'locomotive beings' are also divided into four classes: the *jarāyu-ja* or 'those produced from the womb,' the *aṇḍa-ja* or 'those produced from an egg,' the *svēda-ja* or 'those produced from warm moisture,' and the *udbhij-ja* or 'those produced from a split (in the earth).' Of these the womb-born are the domestic animals, men, beasts of prey, and others.[26] The egg-born are the birds, all slow and quick-moving reptiles, and others. The moisture-born are the worms, insects, ants, and others. The earth-born are the cochineal insects, frogs, and others.

As to the 'stationary beings' (or plants), their bark, leaves flowers, fruit, roots, tubers, exudations, juice, etc., and as to the 'locomotive beings' (or animals), their skin, nails, hair, blood, etc., are the objects of use in medicine. [23]

To the class of *pārthiva* or 'minerals' belong the following:

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hearsing, etc. Mental exercises are thinking, meditating, calculating, etc. The term 'properly' refers to considerations of locality, time, age, etc. So the commentaries.

[25] Examples are: of *vanaspati*, the *Plakṣa* and *Uḍumbara* (or Ficus Tjakela and glomerata), etc.; of *vṛkṣa*, the mango, jāmun (Eugenia Jambolana) and other trees; of *vīrudh*, the *Vidārī*, (Ipomoea digitata), pepper, lovage, *Çālaparṇī* and *Pṛçniparṇī* (Desmodium gangeticum and Uraria lagopoides), etc.; of *ōṣadhi*, wheat and other cereals. (Commentaries).

[26] The commentaries explain that the domestic animals are placed first, because from the point of view of medicinal subserviency, which is here in question, they are the most important.

gold, silver, gems, pearls, realgar, earth, potsherds, and others.[27]:

(13) With reference to time we have the following varieties:- breezy weather, calm weather, sunshine, shade, moon-light, darkness, cold weather, hot weather, rainy weather, day and night, fortnight, month, season, half-year, and other divisions of time. These, by their very nature, exercise an augmenting, or deranging, or relieving, or repressing influence on the humours (and the consequent diseases); hence a knowledge of them is necessary. [24] On this (subject) there are the (following) verses:—

> With regard to the diseases of men the above-mentioned four-fold group[28] of causes of derangement and relief has been laid down by the physicians. [25] Those diseases which are accidental are of two kinds: some affect the mind, others the body; and their treatment is also of two kinds. [26.] For those which affect the body, the treatment is the same as for bodily diseases. In the case of those which affect the mind, sounds and the rest of the (five-fold) group (of sensations)[29] of an agreeable nature bring relief. [27]

(14) Thus far these four terms have been expounded: *puruṣa* or 'the human being,' *vyādhi* or 'disease,' *auṣadha* or 'medica-

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[27] The commentators are much exercised to account for the reason why the *pārthiva* or 'minerals' are not included as a third class of *ōṣadhi* or 'medicaments,' in spite of their being clearly intended to be a kind of medicaments. Nothing satisfactory is said by them. But BHĀ. cites Caraka as giving a threefold division of medicamentary objects, *jaṅgama* or 'animals,' *udbhida* or 'plants' and *pārthiva or* 'minerals.' It almost looks as if in the original system of Suçruta, the minerals were not considered medicinal, but were only introduced afterwards.

[28] Namely, stationary beings, locomotive beings, minerals, and time, according to the physician Jaijjhaṭa; or food, practices (see § 11), minerals, and time. BHĀ. adopts the former, NI., the latter alternative. Neither seems quite satisfactory, though to me the former appears more consonant with Suçruta's text as it now stands.

[29] The five sensations or sense-objects are: sound, touch, form, taste, and smell.

ment,' and *kriyā-kāla* or 'time with reference to its suitability for treatment.' Here the term 'human being' includes not only the whole of the materials which compose his body and which (as stated before in § 9) are themselves composed of the (five) elements,[30] but also the constituent parts of its major and minor limbs,[31] such as the skin, flesh, blood-vessels, nerves, and so forth. The term 'disease' includes not only diseases due to air, or bile, or phlegm, or the blood, or to any of these combined, but diseases of every description (incl. adventitious). By the term 'medicament' must be understood material objects as well as their *guṇa* or 'elementary properties,' *rasa* or 'tastes,' *vīrya* or 'sensific powers,' and *vipāka* or 'digestibility.'[32] The term 'treatment' (*kriyā*) is the general one for all medical operations, such as cutting, etc., and administering oils, etc.[33] The term 'time' (*kāla*) refers to the variety of time (which may be suitable) for any particular (medical) operation.[34] [28]

(15) Here comes in (the following verse) :—

> Herewith I have declared (to you) succinctly the germ or quintessence of the (whole) therapeutical science. I shall (now) give (you) a detailed exposition in one hundred and twenty chapters. [29]

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30 Here the *dravya* or 'materials' are the seven *dhātu* or secondary elements: semen, blood, chyle, flesh, fat, marrow, and bones; while the five *bhūta* (or *mahābhūta*) or primary 'elements' are earth, fire, water, air and *ākāça*. So the commentaries. Usually, however, the term *dravya* connotes the 'material objects,' as distributable among the five classes of *bhūta*; as in ch. 3, § 2 [40], ch. 4, § 2.

31 Major limbs, such as the head; minor limbs, such as the chin. (Commentaries).

32 For an exposition of these four terms, see below chapters 40 and 41.

33 Surgical operations, such as cutting, opening, scarifying, probing, extracting, bleeding, sewing. Again, oils, sudorifics, emetics, purgatives, enemas, fumigations, errhines, gargles, digestives, alteratives, and so forth. (Commentaries).

34 Thus, the forenoon is the time suitable for the administration of emetics, and the early morning for that of purgatives. So Ni.

These one hundred and twenty chapters will be (arranged) in five sections with reference to the subjects (taught in them): the *Sūtra-sthāna* or 'section on general principles;' the *Nidāna-sthāna* or 'section on pathology,' the *Çarīra-sthāna* or 'section on anatomy;' the *Cikitsita-sthāna* or 'section on therapeutics,' and the *Kalpa-sthāna* or 'section on toxicology.' Afterwards I shall expound the remaining subjects in the *Uttara-tantra* or the 'supplementary treatise.' [30]

(16.) Here comes in (the following verse):—

> Whoever studies this (science), promulgated by Svayambhū (or Brahmā) in primeval times, and made known (to the world) by the king of Kāçī (or Benares), that meritorious person is reverenced on earth by kings, and after death attains a position (in heaven) equal to that of Indra. [31]

THE SECOND CHAPTER.

ON THE INITIATION OF A PUPIL. [1]

(1) A physician may admit as a pupil anyone of the Brāhman, Kṣatriya, and Vaiçya castes who is of (good) family,[35] youthful, observant of caste-rules, persevering, clean (in body and mind), well-bred,[36] modest, energetic, strong, attentive, contented, possessed of a good memory, intelligent, and resourceful. His tongue, lips, and teeth should be delicate. His mouth, eyes and nose should be straight. His disposition, speech, and deportment should be agreeable. And he should be able to bear pain. Any one with opposite qualities should not be admitted as a pupil. [2]

(2) When a Brāhman (physician) performs the initiation ceremony, (he should act in the following manner.)[37] On an auspi-

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[35] So NI., but BHĀ. interprets: 'one who belongs to a medical family.' NI. also gives this as an alternative.

[36] *Ācāra* appears to have been wanting in BHĀ.'s recension of Suçruta's text. It does not comment on it, and interprets *çīla* as 'well-bred.'

[37] I have adopted the reading *upanayanīyas=tu brāhmaṇaḥ* or

cious *tithi* or 'lunar day,' *karaṇa* or 'lunar half-day,' *muhūrta* or '30th part of a lunar day' and *nakṣatra* or 'lunar asterism,' in an auspicious direction,[38] on clean and even ground, a sacrificial spot, four cubits square, should be smeared with cowdung and spread with *darbha* grass (*Poa cynosuroides*). Then the gods should be honoured with flowers, fried rice, rice, and jewels, likewise the (officiating) Brāhmans, and the (witnessing) physicians. Then, having marked off (the sacrificial square) and besprinkled it (with water), (the officiant) should place the Brāhman (pupil) on his right, and kindling before himself a fire with the wood of Khadira (*Acacia Catechu*), Palaça (*Butea frondosa*), deodar and bel, smeared with curds, honey and clarified butter, or (with the wood) of the four trees with a milky sap, *viz.*, the Nyagrōdha (*Ficus bengalensis*), Uḍumbara (*Ficus glomerata*), Açvattha (*Ficus religiosa*) and Madhūkā (*Bassia latifolia*),[39] (smeared in the same way), he should offer on it oblations of clarified butter with a sacrificial ladle according to the Darvīhōma rite.[40] Next with the mystical syllable and the great

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'the initiating Brāhman.' Here *upanayanīyas* has the active sense of *upanētā*. I follow herein BHĀ. But NI. adopts the reading *upanayanīyaṁ tu brāhmaṇaṁ* or 'the Brāhman (pupil) who is to be initiated.' But this reading does not well agree with the subsequent context *brāhmaṇaṁ sthāpayītvā* 'having placed the Brāhman (pupil).' The case of the Brāhman physician and the Brāhman pupil is here only given as an exemplar of the initiation ceremony. The commentaries explain that they are only selected *honoris causa*, but that the same ceremonies take place in the case of Kṣatriyas or Vaiçyas ; only in the case of a Çūdra the ceremony is modified, as noted in § 3. They add, however, that of whatever caste the medical teacher who arranges for the initiation may be, the initiation rites themselves must be performed by a Brāhman.

38 *I.e.*, towards the East or North. (Commentaries)

39 The members of this group of trees are variously enumerated. Some give the Plakṣa (*Ficus Tjakela*) in the place of the Madhūkā. Some give the number of the group as five.

40 The *Darvīhōma* rite is well-known as that of Brāhmans who are *chandōvid* or 'proficient in incantations.' So NI.

mystical words[41] he should pronounce *svāhā* in the name of every deity and every Rishi, and cause the pupil to do the same.

(3) A Brāhman may give initiation to a pupil of three castes, a Rājanya (*i.e.*, Kṣatriya) to one of two castes,[42] but a Vaiçya to one of the Vaiçya caste only. Some say that a Çūdra, if he is of (good) family and (good) character, may also be admitted to instruction, but without the initiatory rites.[43] [3]

(4) Then leading the pupil three times round the fire[44] and invoking the fire as witness, he should thus address him: "It must be your inflexible rule to eschew lust, anger, avarice, pride, vanity, envy, rudeness, gossiping, lying, idleness, and every other reprehensible conduct, to keep short your nails and hair, to be clean in your person, to dress yourself in reddish-coloured cloth, and to endeavour to lead an upright, pure, and respectful life. You must be always ready to abide by my directions with regard to residing, going about, lying down, sitting down, eating, and studying, and you must always be intent on furthering my

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[41] The mystic syllable is *ōṁ* and the three great mystic words are *bhūr*, *bhuvaḥ*, *svar*. The formula runs as follows: *Ōṁ bhūḥ svāhā, Ōṁ bhuvaḥ svāhā, Ōṁ svaḥ svāhā, Ōṁ bhūr bhuvaḥ svaḥ svāhā*. So Ni.

[42] That is, to Brāhmans, Kṣatriyas, Vaiçyas, and to Kṣatriyas Vaiçyas, respectively.

[43] Paragraph 3 is clearly a later interpolation, as it interrupts the account of the initiatory ceremonies. According to Ni. it is rejected by the *nibandhas* or 'commentaries.' Bhā., however, admits it, and argues strongly in favour of the Çūdras. The reason of the interpolation in this particular place clearly is to indicate that the preceding portion of the initiatory rites is omitted in the case of a Çūdra, while the subsequent portion (in § 4) is permitted.—According to Ni. there are two readings: either °*saṁpannam=anupanītaṁ*, i.e., 'he may be admitted without any initiating rites'; or °*saṁpannaṁ mantra-varjam=upanītam*, i.e., 'he may be initiated, but without the mantra.' It is not clear which of the two was adopted by Bhā. They are, however, practically equivalent.

[44] In the form of *pradakṣiṇa*, i.e., from left to right, so that the right side is kept towards the fire. So Ni.

pleasure and welfare. If you shall be wanting in all this, you will be a sinner, and your learning will be useless to you and fail to bring you fame. [4] On the other hand, if, while you are regular in the discharge of your duties, I should behave improperly towards you, I shall be committing sin, and my learning will be useless to me."

(5) To treat Brāhmans, spiritual guides, paupers, friends, ascetics, neighbours, devotees, orphans and widows, and people who come from a distance, (gratuitously) with one's own medicines, as if they were one's own relations, is right. But hunters, fowlers, outcasts, and sinners should not be treated. By pursuing such a policy, one makes himself known as learned, and attains friends, fame, merit, wealth, and pleasure. [5]

(6) Here come in (the following verses):—

On the eighth day of the dark half of the month, as well as on its two last days (*i.e.*, the fourteenth and fifteenth); on the same days also of the light half of the month, as well as on the two twilights (*i.e.*, dawn and dusk) of the day; when there is thunder and lightning at unusual times [45]; when one's people or country or king are in distress; [6] during the whole day on which one has been to a cemetery [46]; during the time of a battle, or a festival,[47]

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[45] That is, when rain falls in any of the four months comprising the cold and dewy seasons (*hēmanta* and *çiçira*), *i.e.*, from the middle of November to the middle of March; or when thunderstorms occur in the morning or evening. (Commentaries.)

[46] *Adyatana* is the period of a current day, reckoned either from dawn to dark or from midnight to midnight. This appears to me to be the only rational explanation of the compound word. Both BHĀ. and NI. explain it thus: "on a cemetery or on a slaughter-ground of pack-animals" taking *yāna* to mean *hasty-ādi* or 'elephants, etc,' and *adyatana* to mean *badha-sthāna* or 'place of slaughtering.' I do not understand how the latter meaning for *adyatana* is arrived at.

[47] Such as the festival of Çukra (or Venus) on the full-moon of the month Bhādrapada (August-September); the Kaumudī (or full-moon) festival in the month Āçvina; the festival of

or the appearance of a portent,[48] — (on any of these occasions) the student should never read; nor should he do so at any other time when Brāhmans do not study; nor must he ever read when he is impure. [7]

THE THIRD CHAPTER.

On the Contents of this Work. [1]

(1) It has been already stated (see § 15, p. 12) that the one hundred and twenty chapters (of this work) (will be distributed) in five sections. Of these the (first) section on General Principles will contain forty-six chapters: the (second) on Pathology, sixteen: the (third) on Anatomy, ten: the (fourth) on Therapeutics, forty: the (fifth) on Toxicology, eight. Then will follow the supplementary part with sixty-six chapters. [2]

(2) The following are the forty-six chapters of the *Sūtra-sthāna* or 'Section on General Principles,' which is called so, because in it the whole of the subjects (of medical science) are presented in clear detail, proper arrangement, and orderly development. [11]

- i The origin of the medical science.
- ii The initiation of pupils.
- iii The exposition of the (contents of the several) chapters.
- iv The (importance of) understanding the (medical) terms.
- v Preliminary arrangements in surgical practice.
- vi Regimen (to be observed) in the various seasons.
- vii Description of blunt instruments. [3]
- viii Mode of applying cutting instruments.
- ix (Practical training in) the application of surgery.

Kuvēra (or the god of wealth) at the summer solstice; the festival of Madana (or the god of love) on the thirteenth day of the light half of the month Caitra (March-April), and others. So Ni.

[48] *I.e.*, any extraordinary natural phenomenon indicative of evil, such as an earthquake or hurricane, a mirage or rainbow, or any wonderful change in a planet or star. (So Ni.)

x (Rules with regard to visiting) the sick-room.
xi Preparation and use of caustics.
xii Lecture on actual cautery.
xiii Lecture on leeches.
xiv Discourse on the blood. [4]
xv Instruction with regard to the humours, constituent elements, excretions, etc., (of the body).
xvi Piercing the (lobules of the) ear.
xvii Diagnosis of immature and mature (inflammations).
xviii (Application of) liniments.
xix (General rules of) treating inflamed parts. [5]
xx Things salutary and insalutary.
xxi Enquiry into (the origin of) inflammation.
xxii Discharges from inflamed parts.
xxiii Characteristics of curable and incurable (inflammations).
xxiv Classification of diseases. [6]
xxv Definition of the various kinds of surgical operations.
xxvi Diagnosis of the presence of a dead (*i.e.*, foreign) substance (in the body).
xxvii Extraction of foreign substances.
xxviii Prognosis of inflammations.
xxix Prognostication from the messenger, dreams, etc. [7]
xxx Morbid changes (as promonitory signs of death) in the five senses.
xxxi The same in the general appearance.
xxxii The same in the constitution (of the body).
xxxiii Avoidance (of treating incurable diseases).
xxxiv Treatment of a king engaged in warfare.
xxxv Treatment of the feeble.
xxxvi Miscellaneous formulae (for external applications to inflammations). [8]
xxxvii Different varieties of soil (with reference to the collection of drugs).

xxxviii Classification of drugs.
xxxix Drugs useful for depuration and rectification (of the humours).
xl Exposition of the terms *dravya* or 'material object' and the rest.[49]
xli Predominant characters of drugs. [9]
xlii Information on the (six) *rasa* or 'tastes.'
xliii Preparation of emetics.
xliv Preparation of cathartics.
xlv Various kinds of liquid substances.
xlvi On food and drink. [10]

(3) The following are the sixteen chapters of the *Nidāna-sthāna* or 'Section on Pathology,' which is so called on account of its describing the causes and symptoms (of diseases). [13]

i Diseases of the nervous system.
ii Hemorrhoids.
iii Calculus in the bladder.
iv Fistula-in-ano.
v Skin-diseases.
vi Morbid secretion of urine.
vii Abdominal tumours.
viii Complex labour.
ix Deep-seated abscesses.
x Malignant growths. [12]
xi Glandular enlargements.
xii Scrotal enlargements.
xiii Fractures[50].
xiv Sores on the penis caused by the *çūka* or 'hairy caterpillar.'
xv Minor diseases.
xvi Diseases of the mouth.

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[49] See footnote 30 on p. 12. "The rest" refers to the tastes, elementary properties, sensific powers, and digestibility, see chap. 4, § 2.

[50] Here the order of the chapters in the book itself differs. The fractures form the 15th chapter, while the penis-sores and the minor diseases form the 13th and 14th chapters respectively.

(4) The following are the ten chapters of the *Çarīra-sthāna* or 'Section on Anatomy,' which was propounded by the Maharṣi (*i.e.*, Dhanvantari), in order to give to physicians and Yōgīs or 'wizards' a knowledge of the (constitution of the human) body. [16]

i Theory of the origin of living beings.
ii Rectification of the semen and menses.
iii Impregnation of the womb.
iv Description of the fœtus.
v Description of the (human) body. [14]
vi Exposition of the vital parts (of the body).
vii Description of the vascular system.
viii Venesection.
ix Description of the ducts and nerves.
x Description of pregnancy. [15]

(5) The following are the forty chapters of the *Cikitsā-sthāna* or 'Section on Therapeutics,' which is so called, because it treats of the amending or rectifying or curing or alleviating, as it may be variously termed, (of diseases). [25]

i Treatment of the two kinds of inflamed sores.
ii Treatment of recent inflamed sores.
iii Treatment of fractures.
iv Treatment of nervous diseases.
v Treatment of major diseases of the nervous system.
vi Treatment of hemorrhoids.
vii Treatment of calculus.
viii Treatment of fistula-in-ano. [17]
ix Treatment of skin-diseases.
x Treatment of major skin-diseases.
xi Treatment of morbid secretion of urine.
xii Treatment of eruptions on the skin (in the foregoing disease).
xiii Treatment of diabetes.
xiv Treatment of abdominal enlargements. [18]
xv Treatment of complex labour.
xvi Treatment of deep-seated abscesses.

xvii. Treatment of malignant ulcerations.
xviii Treatment of glandular enlargements.
xix Treatment of scrotal enlargements and diseases of the penis.
xx Treatment of minor diseases. [19]
xxi Treatment of sores on the penis produced by the *çūka* or 'hairy caterpillar.'
xxii Treatment of diseases of the mouth.
xxiii Prevention of inflammatory swellings.
xxiv Prevention of diseases generally.
xxv Miscellaneous formulae. [20]
xxvi Aphrodisiacs in cases of debility.
xxvii Tonic treatment in every kind of ailment.
xxviii Means of strengthening the memory and prolonging life.
xxix (The *Sōma* tonics for) the prevention of (all) natural diseases. [21]
xxx The tonic known by the name of 'pain-killer.'
xxxi Use of medicated oils.
xxxii Modes of sweating.
xxxiii Emetics and cathartics. [22]
xxxiv Treatment of disorders brought on by the misuse of the two preceding remedies.
xxxv Classification of syringes, made of a nozzle and bladder, for clysters.
xxxvi Treatment of disorders caused by (the misuse of) such a syringe.
xxxvii The application of oily enemas by the urethra. [23]
xxxviii Enemas made with other liquids.
xxxix Treatment of a patient weakened (by the use of the above-mentioned remedies).
xl Various kinds of inhalations. [24]

(6) The following are the eight chapters of the *Kalpa-sthānā* or 'Section on Toxicology,' which is so called because (of its treating) of the preparation and use of remedies against poisons. [27]

i The protection of food.
ii Account of vegetable and mineral poisons.
iii Animal poisons.
iv Information on snake-bites.
v Treatment of the latter. [26]
vi Some *dundubhi* or 'far-famed' antidotes [61].
vii Antidotes against rat-bites.
viii Antidotes against insect-bites.

(7) Thus far altogether one hundred and twenty chapters have been described. Hence forward the *Uttara-tantra* or the 'Supplementary Treatise' will be spoken of, with its several (four) parts as hereafter named.'[62] [28] Its first chapter is concerned with the *upadrava* or 'troublesome diseases' (of the eye); hence this (supplementary) treatise is also called the *Aupadravika* or 'Treatise on Troublesome Diseases.' [29] Next follow in order the (various) chapters which describe the diseases (of the eye).

i On troublesome eye-diseases generally.
ii On diseases in the joinings of the eye.
iii On diseases in the eyelids.
iv On diseases in the sclerotica.
v On diseases in the cornea.
vi On diseases in the whole eyeball.
vii On diseases in the lens. [30]
viii Classification of the treatments (of eye-diseases).
ix Curing of ophthalmia caused by (deranged) air.
x Curing of ophthalmia caused by (deranged) bile.
xi Curing of ophthalmia caused by (deranged) phlegm.
xii Curing of ophthalmia caused by (deranged) blood. [31]
xiii On scarification in eye-diseases.
xiv On incision in eye-diseases.
xv On excision in eye-diseases.

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61 The order of these chapters in the book itself differs. There the *dundubhi* form the seventh, and the rat-bites the sixth chapter.

62 For these four parts, see below § 12.

xvi On diseases of the eyelashes.
xvii On diseases of the lens.
xviii Description of external applications (to the eyes).
xix (Treatment of) injuries (to the eyes) caused by violent contact.
xx Diseases of the ears.
xxi Their treatment. [32]
xxii Description of the diseases of the nose.
xxiii Cure of these diseases.
xxiv Cure of coryza.
xxv Description of the diseases of the head.
xxvi Treatment of these diseases.

The preceding (twenty-six chapters) constitute the *Çālākya-tantra* or 'Treatise on Minor Surgery.' [33]

(8) xxvii Description of the nine *graha* (or demoniacal possessions).
xxviii Treatment of the *Skanda*.
xxix Treatment of the *Āpasmāra*.
xxx Treatment of the *Çakunī*.
xxxi Treatment of the *Rēvatī*. [34]
xxxii Treatment of the *Pūtanā*.
xxxiii Treatment of the *Andha-pūtanā*.
xxxiv Treatment of the *Maṇḍikā* [68].
xxxv Treatment of the *Çita-pūtanā*.
xxxvi Treatment of the *Naigamēṣa*.
xxxvii Origin of these seizures.
xxxviii (Cure of the) diseases of the womb.

The preceding (twelve chapters) constitute the *Kaumāra-tantra* or 'Treatise on the Management of Children,' (and refer to the subjects) named in the *Çarīra-sthāna* or 'Section on Anatomy.' [35]

(9) xxxix Cure of fever.
xl Cure of diarrhœa.
xli Cure of consumption.

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[68] In the book itself the chapter on *Maṇḍikā* is placed after that on *Çīta-pūtanā*.

xlii Cure of abdominal tumours.
xliii Cure of heart-diseases.
xliv Cure of morbid palor.
xlv Cure of hæmorrhage.
xlvi Cure of fainting.
xlvii Cure of alcoholism. [36]
xlviii Cure of morbid thirst.
xlix Cure of vomiting.
l Cure of hiccough.
li Cure of asthma.
lii Cure of cough.
liii Cure of aphonia.
liv Cure of worms.
lv Cure of retention of discharges. [37]
lvi Cure of cholera.
lvii Cure of anorexia.
lviii Cure of dysuria.
lxix Cure of strangury.

The preceding (twenty-one chapters) constitute the remainder of the *Kāya-cikitsā* or 'Treatment of the Body.'[54] [38]

(10) lx Cure of diseases caused by superhuman agencies.
lxi Cure of epilepsy.
lxii Cure of insanity.

The preceding (three chapters) constitute the *Bhūta-vidyā* or 'Science of Demoniacism.' [39]

(11) lxiii Enumeration of the (combinations of) tastes.
lxiv Hygienic rules.
lxv Syntactical rules.
lxvi Enumeration of the (combinations of) humours.

The preceding (four chapters) must be understood to serve as embellishments of this treatise.

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[54] The commentary explains that the term 'remainder' indicates that other portions of the 'treatment of the body' have already been given in the preceding part on *çalya* or 'major surgery.' The reference here is clearly to the *cikitsā-sthāna* or 'section on therapeutics.'

(12) On account of its excellence the Maharṣis have called this treatise the *Uttara* or 'superior one.' Its excellence lies in the fact of its comprising so many subjects. It is also called *Uttara* or 'supplemental' by reason of its position at the end. [41] The subjects comprised in it, are the following four:

i Minor surgery,
ii Management of infants,
iii Medical treatment of the body,
iv Science of demoniacism. [42]

(13) The subjects of aphrodisiacs and alterative tonics are included in the *Cikitsā-sthāna* or 'Section on Therapeutics.'[55] [42] The doctrine of poisons is given in the *Kalpa-sthāna* or 'Section on Toxicology.' Information about (the treatment of) foreign substances in the body will be found in every part (of this work). [43]

(14) This work, then, with its above-named eight divisions, first made known by the Primordial Dēva (*i.e.*, Brahmā), whoever will carefully study and use in his practice, he will become a saviour of life in this world. [44] Both are equally necessary: the study of this science as well as its practical application after study. A physician, who is proficient in both, will be honoured by his king. [45]

(15) Here come in (the following verses):—

One who knows medical science only theoretically, but possesses no practical experience, looses his head in the presence of a patient, just as a coward does in the presence of a challenge to fight. [46] On the other hand, he who is well-versed in praxis, but from self-confidence is neglectful of (keeping up) the study of his science,[56] does not obtain the esteem of good men, and deserves to be condemned to death by the king. [47] Both these kinds of

[55] Aphrodisiacs are treated of in the 26th, and alterative tonics in the 27th–30th chapters of that section.

[56] *I.e.*, One who, trusting entirely to his early acquisition of the science as a pupil, neglects to keep up his reading as a practitioner. (Commentaries.)

unqualified physicians are unfit to practice their calling; for possessing only one-half of the knowledge of it, they are like birds that possess only one wing. [48] Medicines, though they are like nectar, become like poison, lightning, or other instruments of destruction, if they are administered by an ignorant practitioner.[57] Therefore such should be avoided. [49] A physician who is unskilled in operations, such as excision and the like, or application of medicated oils and the like, merely kills people from avarice. It is the king's fault, if such bad physicians exist. [50] On the other hand, he who is proficient in both (theory and practice) is fit to intelligently exercise his calling, just as a carriage with two wheels is fit to accomplish its work in the battle. [51]

(16) Now, my son, listen attentively to my instruction, how this (medical science) is to be studied. After having performed the prescribed purifications, the pupil must present himself, dressed in his upper garment and with an undistracted mind, at the hour of instruction; and the tutor should then teach him, according to his capacity, either a word, or a quarter-verse, or a full-verse[58]; and the pupil must repeat these after him, again and again, in their proper order. In this manner the tutor should instruct each pupil separately; and he should himself repeat the lesson after his pupil. The latter should read not too quickly, nor too slowly, nor with fear, nor with a nasal twang, but with distinct utterance of every syllable, and without distortion of any letter, not gesticulating with eye, eyebrows, lips and hands, but (reading) with a well-modulated voice, neither too high, nor too low. Nor should any one pass between tutor and pupil, while they are engaged in study. [52]

(17) Here come in (the following verses) :—

Purified, devoted to his tutor, alert, and eschewing laziness

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[57] The allusion is to the story of Garuḍa who stole the nectar and to whom it turned into poison. So NI.

[58] The text has *çlōka*, i.e., a verse of 32 syllables; and BHĀ. explains that if a medical work is written in prose, the direction refers to clauses of 8, 16, or 32 syllables respectively.

and sleep, the pupil should study: in this wise he will attain complete mastery over medical science. [53] One who has completed his studies should then strive to attain clearness of speech, comprehension of the requirements of any case, confidence in himself, skill and practice in medical work, and success (in his profession). [54]

THE FOURTH CHAPTER.

The Importance of Understanding the Terminology of Medical Science. [1]

(1) Learning by rote without understanding the meaning of what is learned is profitless labour like that of the ass carrying a load of sandalwood. [2] Here comes in (the following verse):—

> As the ass that carries a load of sandalwood is conscious of the (weight of the) load, but not of the (fragrance of the) sandalwood, so those who learn numerous medical text-books, but remain fools with reference to their meaning are, ass-like, mere carriers of a load. [3]

(2) Hence every word, quarter-verse, full-verse, and half-verse,[58] singly, of these one hundred and twenty chapters[59] must be again and again explained (to the pupil) and rehearsed (by the latter.) The reason is that it is a subtle matter to classify and discriminate the material objects, their tastes, elementary properties, sensific powers, and digestibility[32]; the humours and constituent elements of the body, its secretions, viscera, vital parts, blood-vessels, ligaments and nerves,[60] joints, bones, and

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59 This shows very clearly that the Uttara Tantra is a later addition to the original work of Suçruta which only contained 120 chapters, up to the end of the Kalpa Sthāna.

60 The term *snāyu* includes both ligaments and nerves. The nerves are also included in the term *dhamani*, which comprises both ducts (or vasa) and nerves. The latter were not recognised as a distinct part of the body.

all the factors of pregnancy[61]; also to extract foreign bodies, diagnose inflamed sores, and treat fractures; also to prognose the curability or incurability of diseases. These and a thousand other such important matters which require to be thought over are apt to puzzle even men of clear and great intellect, how much more those of small intellect? Hence it is very necessary that every word, quarter-verse, full-verse and half-verse should be over and over again explained (to the pupil) and rehearsed (by the latter). [4]

(3) As subjects will be referred to in this (work) which belong to other sciences, and as it will be necessary (for the pupil) to know their meaning, he must obtain information on them from men learned in those sciences. The reason is that it is impossible in (treating of) any one science to avoid referring to other sciences. [5]

(4) Here come in (the following verses) :—

Any one who knows no more than a single science, can have no thorough knowledge of that science. Hence a physician will not be proficient in his own science, unless he is versed also in many other sciences. [6] A physician who is not content with merely learning his science from the lips of his tutor, but familiarises himself with it by repeated study, he is a true physician; all others are swindlers. [7] The surgical treatises of Aupadhēnava, Aurabhra, Suçruta, and Pauṣkalāvati form the basis of all other treatises on the subject.[62] Hence instruction should be given in those works. [8]

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[61] Such as semen, menstrual blood, etc. (Commentaries.)

[62] According to Ni. the other treatises are those of Karavīrya, Gōpura-rakṣita, etc. But the commentary adds that, according to other commentators, *mūlāni* means only 'most important,' *i.e.*, 'among the various surgical works those of Aupadhēnava, etc., are the most important.'

THE FIFTH CHAPTER.

PRELIMINARY ARRANGEMENTS FOR SURGICAL OPERATIONS. [1]

(1) There are three stages in the treatment (of diseases): the preliminary, the principal, and the after-treatment. These we shall describe separately in the case of each individual disease. In this work, surgery being the most important subject, I shall begin with describing the preliminaries for surgical operations and all the requisites for them. [2]

(2) Of surgical operations there are eight kinds, namely, excision, incision, scarification, puncturing, probing, extraction, letting out pus, and stitching.

(3) Now when a physician desires to perform any operation, he should first of all arrange in a handy place the following articles: blunt and cutting instruments, caustics and cautery, probes, a horn, leeches, a hollow bottle-gourd,[63] a bougie,[64] cotton, pieces of cloth, thread, leaves, bandages, honey, clarified butter, suet, milk, oil, refreshments and decoctions,[65] liniments, pastes, a fan, cold and hot water, pans, and other useful things. (He should) also (provide himself with) trusty, steady, and strong assistants. [3] Then, on an auspicious *tithi* or 'lunar day,' *karaṇa* or 'lunar half-day,' *muhūrtta* or '30th part of a lunar day,' and *nakṣatra* or 'lunar asterism,' after having worshipped Agni (*i.e.*,

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[63] This is the *Alābū* (*Lagenaria vulgaris*), the shell of which is hard and ligneous, and when dried is much used in the East as a vessel for holding fluids of all kinds; also for making guitars and banjos. See *Pharmacographia Indica*, Vol. II, p. 67.

[64] The text has *jāmbav-auṣṭha*, lit. 'having jambu-like lips.' Ni. explains that the bougie is made of a black stone the extremity of which is shaped like the fruit of the Jambu tree (the Jamun or *Eugenia Jambolana*).

[65] The text has *tarpaṇa* and *kaṣāya*. According to the commentaries, *tarpaṇa* means *çaktu* (flour of any parched grain) or milk or other substance mixed with water and given to the patient if he becomes thirsty. *Kaṣāya* is explained as the decoction (to one-quarter or one-eighth) of medicinal plants.

the god of fire), Brāhmans, and (other) physicians with curds, whole (rice-)grains, food, drink, and jewels, offered oblations, and said words of lucky import and welcome, the patient, who must only have taken a light meal, should be set face to face with the physician and firmly secured. The latter, (taking care to) avoid any vital part, bloodvessel, nerve and ligament,[60] joint, bone, or duct,[60] should introduce the instrument in the direction of the hairs of the skin, till pus appears, and then at once and quickly withdraw it.

(4) In large abscesses the instrument may be inserted to the depth of two fingers' breadth. [4] The marks indicating an abscess to be ready for operation are, that it has a large base, rounded form, uniform maturation, and a favourable position. [5] Here come in (the following two verses) :—

> An abscess with a large base, a rounded form, well-matured, and unconnected with any important organ,[66] and (in short) one which is operated on at the proper time, will readily heal by the operation. [6] It will heal, if it is operated on by a physician, who is fearless and quick, whose instrument is sharp, who does not perspire or tremble, and who does not err (in his diagnosis.)[67] [7]

If on the first incision[68] the abscess is not emptied, it should

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[66] The term *su-vibhakta* is rather obscure, even in the commentaries. It seems to be here synonymous with *sama* in § 5 of the Sanskrit text, while in § 5 it seems to be synonymous with *nirāçraya* in § 6.

[67] Or it may mean 'who does not faint (at the sight of blood).' So Ni.

[68] The Sanskrit text has *vraṇa*, lit. 'wound,' hence 'incision.' This word is used, in medical works, with two different meanings. It may mean either simply 'a wound,' or it may be equivalent with *çōtha* or 'inflammation,' 'an inflamed sore or swelling.' Thus Bhā. says here: *çōthō 'pi vraṇa-hētutayā vraṇa ucyatē*, i.e., 'an inflamed swelling' may also be called a *vraṇa*, when it is caused by a wound or sore.

be carefully explored, and other incisions should be made. [8] Here comes in (the following verse) :—

> In whatever direction (a physician) perceives a sinus, and wherever there is (still) a collection (of pus), there he should 'make an incision, lest any pus should remain behind. [9]

In the following places: eyebrows, cheeks, temple, forehead, eyelids, lips, gums, armpits, abdomen, and groin, a transverse incision is indicated. [10] A circular incision should be made on the palms and soles, and a semicircular, on the anus and penis. [11] Otherwise a bloodvessel or ligament or nerve may be divided, and thus excess of pain, and delay in the coalescing and granulating of the wound will be caused. In the case of complex labour, enlargements of the abdomen, hœmorrhoids, calculus, fistula-in-ano, and mouth-diseases,[69] the operation should be performed (on the patient) in empty stomach. [12]

(5) After the operation, the physician should revive the patient with cold water, and then press the wound all round with his fingers (to empty it thoroughly), smooth it down, wash it with an astringent decoction, wipe it with a piece of cloth, and insert into it a tent thickly smeared with a paste of sesamum-seed, honey and clarified butter, and impregnated with (depuratory) drugs. Next he should cover it with a paste (of suitable drugs), place over this a thick pad,[70] neither too wet nor too dry, tie (the whole) with a bandage, and fumigate it with pastils made of pain-killing drugs.[71] He should also, for the patient's protection from dangers, pronounce *mantras* or 'charms' against evil spirits. [13]

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69 In the case of mouth-diseases the reason is that owing to the pressure of the operator's fingers, etc., or from disgust, the food is thrown up again, and the operation is interfered with. So Ni. Bhā. only gives the latter alternative.

70 The pad may be made either of the crushed bark and leaves of the *Palāça* (*Butea frondosa*), *Uḍumbara* (*Ficus glomerata*) and other trees; or of two or four folds of a soft piece of cloth; or of powder of parched wheat mixed with clarified butter. So Ni., but Bhā. only gives the first method.

71 The object of fumigation is to ward off flies, etc. So Bhā.

(14) Also the place should be fumigated[72] with pastils made of the powders of Indian *bdellium*, aloe-wood, resin of the Sal tree, (root of) Vachā (*Acorus Calamus*), and white mustard, mixed with salt and Nīm-leaves, and done up with clarified butter. With the rest of the clarified butter (thus done up) the patient's vital parts (*i.e.*, the heart, etc.) should be anointed. Then taking water from the drinking-water vessel, and sprinkling it (in the room), the physician should pronounce the subjoined protective incantation[73]. [14]

(15) For the sake of warding off the malice of the Kṛtyās[74] and Rakṣasas, I am performing this protective rite. May Brahmā approve of it! [15] Nāgas, Piçāchas, Gandharvas, ancestral Ghosts, Yakṣas, Rākṣasas:[75] whoever of these may trouble you, may Brahmā and the other gods always kill them! [16] May the spirits that walk at night in the earth and sky, as well as those that dwell in the four quarters and in the habitations of men, and whom I now salute, protect you. [17] May the Munis (or sages) keep you and Brahmā and the heavenly beings, and the Rājarṣis (or royal sages): also the mountains, and all rivers, and all seas! [18] May Agni (or the god of fire) protect your tongue, and Vāyu (or the god of wind) your respirations.[76] May Sōma (or the god of the

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[72] For the purpose of deodorising the sick-room, as well as driving away blue-bottles and other flies which otherwise would breed maggots in the wound. So Ni.

[73] The following incantation is in verse.

[74] *Kṛtyā* is a female Rākṣasa or fiend, raised by the evil machinations of an offended sorcerer. So Ni.

[75] See ante, note 9.

[76] The Hindūs believe in five *prāṇas* or 'vital airs': 1, *prāṇa* whose functions are the respirations, also diglutination, and propulsion of the blood; 2, *vyāna* whose functions are all muscular and vascular movements; 3, *apāna* whose functions are every kind of secretion; 4, *udāna* whose function is the production of every kind of voice; 5, *samāna* whose function is the whole of the assimilative process.

moon) protect your movements, and the clouds your secretary functions. [19] May the lightnings keep your vocal functions, and the thunders your assimilative functions, and Indra, the lord of power, your strength, and Manu [77] your two cervical tendons as well as your intelligence. [20] May the Gandharvas prosper your desires, and Indra keep your good qualities, and king Varuṇa your knowledge, and the ocean your navel. [21] May the sun keep your eyes, the quarters your ears, and the moon your thoughts. May the lunar asterisms ever keep your figure, and the nights your appearance. [22] May the waters promote the flow of your semen, and the medicinal herbs the growth of your hair. May the sky keep your canals, and the earth your body. [23] May Vaiçnāvara (or the god of wealth) keep your head, Viṣṇu your energy, the best of men (*i.e.*, Nārāyaṇa) your manly vigour, Brahmā your vitality, and the polar star your eyebrows. [24] May (all) these divinities, each with respect to his own part of your body, for ever keep you, and may you attain long life. [25] May the blessed Brahmā grant you welfare, and the Dēvas, as well as the sun and the moon, and both Nārada and Parvata.[78] [26] May Agni grant you welfare, and Vāyu, and all the Dēvas that attend on Indra. May the protection granted by Pitāmaha (*i.e.*, Brahmā) procure you welfare and long life. [27] May all calamities of the season be mitigated for you, and may you ever be free from distress. Svāhā (or Amen). [28] By this vedic incantation, for the removal of all diseases caused by Kṛtyā, your safety has now been secured by me. May you now attain long life! [29]

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77 "Manu" here refers to Prajāpati (so Nɪ.) or the primordial, 'man,' a son of Brahmā, the demiurge of the world, and father of the human race.

78 Nārada and Parvata are a pair of ancient, semi-mythical (*dēvarṣi*) sages, descendants of Kaṇva, and authors of certain hymns in the Ṛgvēda. They are said to act as 'messengers of the gods.'

(16) Then he should remove the patient, thus protected, into the house, and prescribe his regimen. Then on the third day, he should open the bandage and, after cleaning the sore, re-apply it. He should be careful not to change the dressing on the second day. [30] If the dressing is changed on the second day, the sore will granulate and consanesce only with much delay, and will become very painful. Thenceforward,[79] he should give directions regarding astringents, liniments, bandages, diet and conduct, in accordance with the state of the humours, the (requirements of the) seasons and the strength (of the patient). Nor should he be in any hurry about causing an abscess to consanesce, if it still contain any pus; for even a slight irregularity in the treatment will cause a gathering within, and the abscess will form anew. [31] Here come in (the following verses):—

> Hence (the physician) should allow an abscess to consanesce only when it is entirely depurated within as well as without. Even during the process of consanescence (the patient) should abstain from indigestible food, violent exercise, and sexual intercourse, and (avoid excitements from) pleasure, anger, or fear, until the wound has firmly healed. [32] In the seasons of Hēmanta (December–February), Vasanta (February–April) and Prāvṛṣ (June–August) the physician should, as a rule, change the bandage every third day, but every second day in Çarad (October–December), Grīṣma (April–June), and Varṣā (August–October).[80] [33] In diseases of very rapid pro-

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[79] *I.e.*, from the fourth day. So the commentaries.

[80] The now current recension of the first half of this verse runs as follows: *hēmantē çiçirē c=aiva vasantē c=āpi mōkṣayēt*, i.e., 'in the seasons of Hēmanta (November–January), Çiçira (January–March) and Vasanta (March–May) he should, as a rule, change the bandage (every third day).' There is, however, another recension, which runs as follows: *hēmantē ca vasantē ca prāvṛṭ-kālē ca mōkṣayēt*, i.e., 'in the seasons of Hēmanta (December–February), Vasanta (February–April) and Prāvṛṣ (June–August) he should, as a rule, change the bandage (every third day).' This recension is mentioned by both NI. and BHĀ., but both

gress, the physician need not observe these directions. In such a case, as with a house on fire, he must adopt swift remedial measures. [34] If, from the application of the

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reject it on account, as they say, of the heat which characterises the season of Prāvṛṣ or the early rains. They explain that the reason of the injunction to change the dressing on the third and the second days is that the seasons of Hēmanta, Çiçira and Vasanta are characterised by cold, while those of Çarad, Grīṣma and Varṣā are characterised by heat; now in a cold season there is no fear of any rapid suppuration setting in, while in a hot season there is that fear; hence arises the necessity of changing the bandage more frequently (*i.e.*, every second day) in the latter seasons than (*i.e.*, every third day) in the former. This reasoning I fully admit; nevertheless I am disposed to believe that the rejected recension is the correct one, and accordingly I have ventured to adopt it in my translation. From the next chapter (the sixth) it will be seen that there are two divergent systems of arranging the seasons, which I may call the civil and the medical. The following table will render these two systems clear.

I. The civil arrangement of the seasons.

Season.	Months.	Months.
(1) Çiçira	Māgha-Phālguna	15th January–15th March
(2) Vasanta	Caitra-Vaiçākha	15th March–15th May
(3) Grīṣma	Jyēṣṭha-Āṣāḍha	15th May–15th July
(4) Varṣā	Çrāvaṇa-Bhādrapada	15th July–15th September
(5) Çarad	Āçvina-Kārttika	15th September–15th Nov.
(6) Hēmanta	Mārgaçīrṣa-Pauṣa	15th November–15th Jany.

II. The medical arrangement of the seasons.

(1) Vasanta	Phālguna-Caitra	15th February–15th April
(2) Grīṣma	Vaiçākha-Jyēṣṭha	15th April–15th June
(3) Prāvṛṣ	Āṣāḍha-Çrāvaṇa	15th June–15th August
(4) Varṣā	Bhādrapada-Āçvina	15th August–15th October
(5) Çarad	Kārttika-Mārgaçīrṣa	15th Oct.–15th December
(6) Hēmanta	Pauṣa-Māgha	15th Dec.–15th February

It will be noticed that in these two systems the seasons overlap one another, and that while the civil system omits the season of Prāvṛṣ, the medical omits the season of Çiçira.

instrument, the patient suffers severe pain, relief may be given him by the application to the part of tepid clarified butter mixed with liquorice.

It will be also noticed that the recension which the commentaries reject follows the medical system, while the commentaries adopt the recension which follows the civil system. This can hardly be thought consistent. But further: Prāvṛṣ or the early rainy season, which the commentaries reject on account of its heat, is as a matter of fact (and as the experience of any one who has lived in India will bear out) a comparatively cool season; any way, it is cooler than the admittedly hot seasons of Varṣā (or later rains), Çarad and Grīṣma, and also cooler than the Vasanta of the civil system, which the commentaries adopt; for that civil Vasanta runs from the 15th March to the 15th May, which includes the nearly hottest time in India. The recension which I have adopted is surely, in every way, the most consistent; it gives the Hēmanta and Vasanta of the medical system which include the coolest time of the year (15th Dec. to 15th April), it also gives the Prāvṛṣ which is the comparatively coolest time (15th June to 15th August) within the Indian hot period of the year (April to November). I suspect the only reason which originated the other recension, adopted by the commentaries, is an apparent incongruity; *viz.*, the interruption in the sequence of the seasons in the rejected recension, for here Prāvṛṣ comes between Grīṣma and Varṣā. For this reason, apparently, the commonly received recension follows the civil system, and thus, by rejecting Prāvṛṣ and adopting Çiçira, establishes an uninterrupted sequence of seasons in its rule about changing of bandages. But thereby, as it appears to me, medical consistency is sacrificed.—The commentaries further explain that the expression 'as a rule' (in Sanskrit *caiva* or *cāpi*) permits a relaxation of the rule in the case of sores characterised by deranged bile (*paittika*). These require dressing every second day, or even every day according to the seasons.

THE SIXTH CHAPTER.

REGIMEN TO BE OBSERVED IN THE DIFFERENT SEASONS. [1]

(1) Time, in truth, is the great Self-existent Being,[81] without beginning, middle and end. From it depend the destruction and production of all material objects[82] and the life and death of men. (Hence comes its name *kāla* 'time'); for *kāla* is either that which never ceases for the smallest *kalā* or 'moment'; or it is that which *saŋkalayati* or 'composes,' or which *kālayati* or 'destroys' living beings.[83] [2]

(2) Time, considered as a year, is divided by the blessed Sun, through his own motion, in (periods called severally) *akṣi-nimēṣa, kāṣṭhā, kalā, muhūrtta, ahō-rātra, pakṣa, māsa, ṛtu, ayana, saṁvatsara,* and *yuga*. [3] Now a *nimēṣa* or 'wink of the eye' is the time required to pronounce a short syllable. Fifteen *nimēṣa* make a *kāṣṭhā*. Thirty *kāṣṭhā* make a *kalā*. Twenty *kalā* plus one-tenth of a *kalā* make a *muhūrtta*.[84] Thirty *muhūrtta* make

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81 The text has *bhagavān Svayambhūḥ*, which lit. means that time is identical with 'the Blessed Svayambhū' or Brahmā. *Svayambhū* means 'self-existent.'

82 The text has *rasa* or 'taste;' but both commentaries explain that here, by that term, are signified the *dravya* or 'material objects,' as being the seats of the tastes.

83 'Composing' refers to the five elements which make up the body and into which it is separated when it dies (see Chap. I, § 9). *Kālayati* is a denominative verb, formed from *kāla*, which means not only time but also death.

84 BHĀ. here points out that the equation $20\frac{1}{10}$ *kalā* = 1 *muhūrtta* agrees with the subsequent statement, in the 14th chapter on blood, that the *rasa* or 'chyle' takes one mouth (or 30 days) to complete one circulation by staying 3015 *kalās* in each of the 6 elementary parts of the body. Accordingly it takes 5 days or 150 *muhūrttas* for each elementary part; hence 1 *muhūrtta* is equal to ($\frac{3015}{150}$ or) $20\frac{1}{10}$ *kalā*. BHĀ. adds that this equation is founded on Aupadhēnava's treatise, (see chap. I, § 2.) It further says that the statement of Bhōja and Bhālluki that a *muhūrtta* is equal to only 20 *kalā*, must be explained as a clerical error (*lipi-dōṣa*). NI. only says that the equation of $20\frac{1}{10}$ *kalā* = 1 *muhūrtta* is refuted by the commentaries (*nibandha*).

an *ahō-rātra* or 'the period (of a full day) comprising day and night.' Fifteen *ahō-rātra* make a *pakṣa* or 'half-month'; this is of two kinds: the light and the dark.[85] These two together make up a *māsa* or 'month.' [4] Next the twelve months, beginning with Māgha, make up six seasons, each consisting of two months. These are *Çiçira, Vasanta, Grīṣma, Varṣā, Çarad, Hēmanta.* Of these Çiçira consists of the months *Tapas* and *Tapasya;* Vasanta, of *Madhu* and *Mādhava;* Grīṣma, of *Çuci* and *Çukra;* Varṣā, of *Nabhas* and *Nabhasya;* Çarad, of *Iṣa* and *Ūrja;* and Hēmanta, of *Sahas* and *Sahasya.*[86] [5] The foregoing division is from the point of view of winter, summer and rains; but from the function of the sun and moon as dividers of time, there result two *Ayana* or 'paths': a southern and a northern. Of these, the southern (path) consists of (the seasons) *Varṣā* or 'the rains,' *Çarad* or 'autumn,' and *Hēmanta* or 'winter.' In these (months) the blessed *Sōma* or 'the moon' is very powerful, and the acid, saline and sweet tastes grow strong, and from month to month all living beings continue increasing in strength. The northern (path) consists of the months *Çiçira* or 'early spring,' *Vasanta* or 'spring,' and *Grīṣma* or 'summer.' In these the blessed *Arka* or 'the sun' is very powerful, and the bitter, astringent and acrid tastes grow strong, and from month to month all living beings continue decreasing in strength. [6] Here comes in (the following verse):—

> The moon (lit. 'the cold-rayed one') moistens the earth; and the sun (lit. 'the brilliant one') dries it. The

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[85] Both commentaries observe that the position of the light before the dark half indicates that the author of the treatise followed the *amāvasya* mode of reckoning. But Nɪ. adds that, according to another reading, the dark precedes the light half.

[86] The more usual names of these months are: *Māgha* and *Phālguna; Caitra* and *Vaiçākha; Jyēṣṭha* and *Āṣāḍha; Çrāvaṇa* and *Bhādrapada; Āçvina* and *Kārttika; Mārgaçīrṣa* and *Pauṣa.* See below, § 9. For the identifications of the seasons, see *ante* Chap. V, § 16, note 80. *Māgha* runs from the middle of January to the middle of February. Similarly *Phālguna* is February-March, and so forth, *Sahasya* being December-January.

air, in conjunction with these two, maintains all living beings. [7]

Again the two *Ayana* or 'paths' together make one year, and five of these (years) together make one *Yuga* or 'lustrum.' This whole series of divisions of time, from the *nimēṣa* or 'a wink' to the *yuga* or 'lustrum,' as it is always going round like a revolving wheel, is called by some the *Kāla-cakra* or 'the wheel of time.' [8]

(3) Now with reference to the growth, derangement and rectification of the humours, the seasons may be also arranged thus:[87] *Varṣā* or 'the rains,' *Çarad* or 'autumn,' *Hēmanta* or 'winter,' *Vasanta* or 'spring,' *Grīṣma* or 'summer,' and *Prāvṛṣ* or 'the early rains.' These seasons, beginning with the month Bhādrapada are also constituted of two months each, as follows: Varṣā comprises the months *Bhādrapada* and *Açvayuja*; Çarad, the months *Kārttika* and *Mārgaçīrṣa*; Hēmanta, the months *Pauṣā* and *Māgha*; Vasanta, the months *Phālguna* and *Caitra*; Grīṣma, the months *Vaiçākha* and *Jyaiṣṭha*; Prāvṛṣ, the months *Āṣāḍha* and *Çrāvaṇa*. [9]

(4) Now in the rainy season the annuals[88] are young and weak in their sensific powers, and the waters are muddy and mostly full of dirty matter[89] fallen (into them) from the earth. From the use of these acidity of the stomach[90] is produced in

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[87] This is, of course, the medical division of the year, contrasted with the civil division previously explained. So, on the whole, both commentaries, though they give a more fanciful reason for pre-positing the civil year, because that year refers to the growth and strength of the *rasa* or 'tastes' which are the causes of the humours. BHĀ. adds (only to refute it) that according to Kāçyapa the two systems of divisions are held to the north and south of the Ganges respectively, because there is more rain (hence two rainy seasons) in the South, while there is more cold (hence two springs) in the North. NI. only mentions this theory, without naming its author, and says that Gayādāsa refutes it.

[88] Such as wheat, rice, chickpeas, etc. So NI. The text has *ōṣadhi*; see chapter I, § 12.

[89] Such as decayed leaves, dead and putrifying animals. So NI.

[90] Here as well as below, the expression used in the text is

men, whose digestion has become impaired through their air being deranged by cold, owing to their bodies being kept in a moist condition by living on ground saturated with the rains from the cloud-charged skies: and in consequence of the acidity of the stomach, they bring on an accumulation of bile. Then, in the autumn, when the sky clears up and the sloughs dry, the accumulated bile, diffused (through the body) by the rays of the sun, generates diseases which owe their origin to (deranged) bile. [10] In the winter, these same annuals, from the fulness of time, attain their full sensific powers, and the waters become clear. Thus they become emolient and heavy, and from their use dyspepsia[90] is produced in men, whose bodies are affected by the frosts and (cold) winds due to the mildness of the sun's rays: and in consequence, through their emollient, cold, heavy and sticky qualities, they bring on an accumulation of phlegm. Then in the spring, when the accumulated phlegm is diffused (through the body) by the rays of the sun, it generates in men, now less affected (by the cold), diseases which arise from (deranged) phlegm. [11] In the summer, the same annuals become dry, sapless, and excessively light, and the waters likewise. From the use of them, through their dry, light, and sapless nature, they bring on an accumulation of air in men, whose bodies are dry from the heat of the sun. Then, in the early rains, when men's bodies are kept moist by (living on) ground saturated with water, the accumulated air, diffused (through their bodies) by the chilly winds, generates diseases due to the (deranged) air. Thus it has now been shown how the accumulation of the humours is the cause of their derangement. [12]

(5) Now the depuration of the humours which have accumulated severally in the rains, winter and summer should, as a rule, only be undertaken after their derangement has come to a head

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the same: *vidāha* or *vidagdha*, which literally means 'burning' or 'burned,' and figuratively, 'digested' as well as 'badly digested,' 'turned sour,' etc. BHĀ. explains it as "sluggish digestion due to the production of acidity." NI. explains it by *amlapāka*, lit. 'sour digestion'; and Dr. A. C. Dutt explaines it by *ām-ājīrṇa* or 'imperfect digestion.'

in the autumn, spring, and early rains respectively.[91] [13] This done, the rectification of diseases may be undertaken in accordance with their respective nature; that of diseases due to bile, in the winter; that of diseases due to phlegm, in the summer; and that of diseases due to air, in the autumn. In the foregoing remarks the way has been fully described in which the humours accumulate, become deranged, and are rectified. [14] With reference to these points, the forenoon may be said to be the analogue of the spring; the noon, of the summer; the afternoon, of the early rains; the dusk, of the rains; the midnight, of the autumn; and the dawn, of the winter. Hence with regard to the accumulation, derangement and rectification of the humours, the full period consisting of a day and night must be understood to be analogous to a year consisting of winter, summer, and the rains. [15]

(6) Further, when the seasons are regular, the annuals as well as the water are also wholesome; and their use gives to people longevity, strength, energy and vitality. On the other hand, irregularity in them is owing to fate. Cold, heat, wind and

[91] Both commentaries explain that the phrase "as a rule" (Sanskrit *ca*) shows that the direction is a permissive one and does not apply to very acute diseases which require instant remedial measures. They add that the *saṁçōdhana* or 'depuration' should be done, as a rule, after the lapse of the third month of the total period, *i.e.*, in the second month of the respectively suitable season. Thus bile should be depurated in the month Mārgaçīrṣa; phlegm, in Caitra; and air, in Çrāvaṇa. Bhā. quotes from Bhaṭṭāra Hariçcandra the following rule: *varṣ-ādi-sañcitān-dōṣān=tri-mās-āntaritān=harēt*, i.e., 'the humours which have accumulated in the rains and other seasons may be removed after the lapse of three months.' The following table gives a summary:—

Humour.	Accumulation.	Depuration.	Rectification.
Bile.	Rains (4).	Autumn (5), Mārgaçīrṣa.	Winter (6).
Phlegm.	Winter (6).	Spring (1), Caitra.	Summer (2).
Air.	Summer (2).	Early rains (3), Çrāvaṇa.	Rains (4).

The numbers refer to the medical system, see note 80.

rain, when they are irregular,[92] cause the annuals and water to become unwholesome, and their use produces all sorts of diseases, or even deadly epidemics. Hence the use of wholesome annuals and water (is to be recommended). [16] Sometimes even with regular seasons, the people of a country suffer through some sorcery or some curse or the wrath of evil spirits or the wickedness of men. When wind carries into a country the exhalations of the flowers of poisonous animals, its people are attacked with cough, asthma, vomiting, nasal catarrh, headache, or fever, without any particular reference to the condition of their humours (at the time), but simply owing to the (noxious) influence of the planets or lunar asterisms or to an inauspicious sign in one's house, or wife, or bed, or seat, or conveyance, or beast of burden, or jewel, or gem, or any utensil. [17] In such a case the impending evil may be turned into good by leaving the place, or by (performing) propitiatory or expiatory rites, or by (using) amulets, incantations, burnt-offerings, dedications, donations, salutations, devotions, asceticism, observances, kindness, charities, receptions of *mantras* or 'charms' and advice. Any of these means may be resorted to with reference to Dēvas (or 'gods'), or Brāhmans, or Gurus (or 'spiritual guides'). [18]

(7) In the following (verses) we will describe the characters of the seasons when they are regular:—[19]

> In Hēmanta or 'winter' a cold wind blows from the North, the atmosphere is charged with dust and smoke, the sun is obscured by mists, all pieces of water are covered with ice, [20] crows, rhinoceroses, buffaloes, rams and elephants are made bold, and Rōdhra (*Symplocos racemosa*), Prigaŋgu (*Aglaia Roxburghiana*) and Punnāga (*Ochrocarpus longifolius*) bear flowers. [21] In Çiçira or 'early spring,' the cold is intense, and the atmosphere is full of rain and wind; for the rest its character may be said to be the same as that of the winter. [22] On the Malaya mountains, marked by the red-stained soles of the wives of Siddhas and Vidyādharas,[93] and scented

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[92] Either in amount or incidence. So Ni.

[93] Two classes of supernatural beings, possessed of magical powers.

through the womanly embrace of the sandal trees, [23] there blows, in Vasanta or 'spring,' a wind from the South which stimulates love, makes happy the lovers, and breaks down reserve between husband and wife. [24] In Vasanta or 'spring' the sky is clear; the groves are adorned with the flowers of the Kiṁçuka (*Butea frondosa*), Ambhōja (*Nelumbium speciosum*), Vakula (*Mimusops Elengi*), Cūta (*Mangifera indica*), Açoka (*Saraca indica*) and other trees, [25] the delightful music is heard of the Indian cuckoo and of swarms of bees, the wind blows from the South, and the country is charmingly adorned with fresh green. [26] In Grīṣma or 'summer' the sun's rays are hot, the wind blows unpleasantly from the South-west, the earth is scorched, the rivers are low, the sky is, as it were, on fire, [27] the Cakravāka-pairs[94] wander about, and the beasts of the forest are distracted for want of water, the shrubs, grasses and creepers wither, and the trees drop their leaves. [28] In Prāvṛṣ or 'the early rains,' the sky is covered with clouds, brought by the west wind and discharging heavy showers of rain with tremendous thunder and lightning, [29] the earth is covered with beautifully green young grass, and is bright with the cochineal insert, and gay with (the flowers of) the Kadamba (*Anthocephalus Cadamba*), Nīpa (a variety of *Cadamba*), Kuṭaja (*Holarrhena antidysenterica*), Sarja (*Shorea robusta*), and Kētakī (*Pandanus odoratissimus*). [30] In Varṣā or 'the rains' the rivers are full of water and its banks (strewn) with uprooted trees, the reservoirs are radiant with full-blown white water-lilies and blue lotuses, [31] on the ground level land and holes cannot be distinguished, the fields are adorned with manifold crops, the rain falls without much thundering, and the sun is hidden by clouds in the sky. [32] In Çarad or 'autumn' the sun is ruddy and hot, the sky is clear and shows white clouds, the ponds are pretty

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[94] The *Anas Casarca*, commonly called the ruddy goose or Brahmany duck.

with water-lilies and geese sporting among them, [33] the ground, according as it is depressed or raised or flat, forms ponds or dry land or is covered with trees, and is beautified with the flowering Vāṇa (*Barleria cristala*), Saptāhva (*Alstonia scholaris*), Bandhūka (*Pentapetes phoenicea*), Kāça (*Saccharum spontaneum*), and Asana (*Terminalia tomentosa*). [34] On the other hand, if there is any excess, or contrariety, or irregularity in the characters of the seasons, the humours of the body are deranged. [35] Phlegm should be depurated in the spring, bile in the autumn, and air in the rains, if it is desired to prevent the outbreak of any disease. [36]

THE SEVENTH CHAPTER.

Description of Blunt Instruments. [1]

(1) Of blunt instruments there are one hundred and one (varieties). Among these the hand must be accounted the foremost, for the reason that, without the hand, no instrument can be used, and that every surgical operations must be directed by it. [2] Foreign bodies are those that cause injury to the body and the mind : and the instruments are the means of removing them. They are of the following six kinds : cruciform instruments,[95] pincer-like instruments, picklock-like instruments,[96] tubular instruments, pricker-like instruments, and accessory instruments. [3]

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[95] The text has *svastika* which is shaped like a Greek cross but with the ends of its arms bent rectangularly in the same direction. All instruments of this kind are made with two arms, moveable on a pin placed nearer to one end than the other, by which they are fastened, and on which they act crosswise like scissors. They as well as the *sandaṁça* or 'pincer-like' instruments are merely different varieties of the forceps.

[96] The text has *tāla* which means a lock and key. The ordinary Indian key is merely a picklock or hook.

(2) Now there are twenty-four varieties of cruciform instruments, two pincer-like, also two picklock-like, twenty tubular, twenty-eight pricker-like, and twenty-five accessory. As a rule, they are made of iron, but sometimes, in default of it, of other suitable materials.[97] The ends of these instruments generally resemble the faces of beasts or birds of prey. Hence they should be made so as to resemble them, following herein (the directions of medical) text-books, or (the verbal) instruction (of teachers), or (simply) imitating (other) instruments (of the same kind), and (withal) adapting them (to the requirements of each individual case). [4]

> They should be made just of the proper size, with their ends strong and polished;[98] they should be also solid, well-shaped, and capable of a firm grasp. [5]

(3) Now the cruciform instruments should be made of the length of eighteen fingers' breadth. Their ends should be shaped like the faces of the (following nine kinds of wild animals:) lion, tiger, wolf, hyena, bear, panther, cat, jackal, and deer, (and the following fifteen kinds of wild birds:) crow, heron, osprey, blue-jay, bhāsa,[99] hawk, owl, kite, vulture, falcon, Krauñca (*Ardea jaculator*), fork-tailed shrike, Anjali-karṇa,[100] Avabhañjana,[100] and Nandimukha (*Turdus Ginginianus*). The (two) arms should be held together by a pin in the form of a Masūra (*Ervum lens*), and their ends should be curved like an elephant driver's hook. These (instruments) are intended for the purpose of extracting foreign bodies (impacted) in bones. [6]

(4) The pincer-like instruments are of two kinds: with or without arms.[101] They have a length of sixteen fingers' breadth,

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[97] The Commentaries mention ivory, horn and wood.

[98] According to others "their ends should be gross (like a heron's beak) or fine (like a lion's teeth)" as the particular operation may require. So Ni.

[99] A kind of vulture that frequents cowsheds. So Ni.

[100] These two birds are of unknown identity, according to Ni. Bhā. explains none of the animals or birds.

[101] As the commentaries explain, the one with arms is like that used by barbers for depilating the nose, while the armless

and are intended for the purpose of extracting foreign bodies from the skin, muscles, veins, and nerves or tendons. [7]

(5) The picklock-like instruments have a length of twelve fingers' breadth, and are shaped like the jaws of a fish.[102] They are made either with one blade or two blades, and are intended for the purpose of extracting foreign bodies from the ears, nose, and outer canals. [8]

(6) The tubular instruments are of various kinds and used for various purposes, and have a mouth either at one or at both ends. They are employed for the extraction of foreign bodies from the outer canals, for the inspection of (internal) diseases, for the suction (of fluids), and for the facilitation of (other) operations.[103] In circumference and length they are adapted to the orifice of the outer canal or to whatever purpose may be in hand. The instruments (of this kind) are those used in the case of fistula-in-ano, hæmorrhoids, tumours, abscesses, injections into the rectum and into the bladder, hydrocele, ascites, inhalations, stricture of the urethra and stricture of the rectum. Gourds and horns (used for capping) also belong to this class. All these instruments will be described in detail further on. [9]

(7) The pricker-like instruments (or probes) also are of various kinds, used for various purposes, and are made of various diameters and lengths according to the purpose in hand. Some of

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one is like that used by goldsmiths. The latter is made of two blades, soldered together at one end; while the former consists of two arms jointed crosswise on a pin. This, therefore, is really a variety of the *svastika* or 'cruciform' instrument, and would seem to be classed here only because of its different function.

[102] The picklock is a hook or metal blade curved rectangularly at one end. Two of these may be jointed at the other end; the instrument then resembles the mouth of a certain fish. According to the commentaries this fish is the *Bhēṭunī* or *Bhēṭulī* or *Bhēkaṭī*, the tips of whose jaws are hooked. Both BHĀ. and NI., however, give an alternative interpretation of the word *tāla* which they seem to prefer. They make it to mean *matsya-çalka* or *matsya-cakra*, i.e., 'the scale of a fish.' BHĀ. also gives the alternative reading *tālu* 'palate' for *tāla*.

[103] Such as the scarification of piles. So the commentaries.

them have their ends shaped like earthworms, or the feathered part of an arrow, or the hood of a snake, or a fish hook, there being two varieties of each shape. These are intended respectively for the purpose of exploring, raising, transferring, and extracting.[104] Two of them have their ends made of the shape and size of the half of a pea and slightly bent, and are used for the purpose of extracting foreign bodies from the outer canals. Six have their ends covered with cotton and are used for the purpose of wiping out (abscesses). Three have their ends shaped like spoons with a conical cavity, and are used for the purpose of applying caustic solutions, etc. Three others have their ends shaped like the fruit of the Jambu tree (*Eugenia Jambolana*), and again three, like an elephant driver's goad. These six (varieties) are used for the purpose of applying the actual cautery. One variety, which is used for the purpose of removing a tumour from the (interior of the) nose, has its end made of the size of half the stone of the fruit of the jujube tree (*Ziziphus Jujuba*), of a conical shape, and with sharp edges. One variety, which is used for the purpose of applying collyria (to the eyes), is made of the thickness of a Kalāya pea (or small Masūra or *Ervum Lens*) with both ends shaped like buds.[105] One variety, which is used for the purpose of clearing the urethra, is made of the thickness of the upper part of the stalk of the flower of the Mālatī (*Jasminum grandiflorum*). [10]

(8) The accessory instruments are (the following :—) thread, twine,[106] bandages, straps (or belts) of leather, bark (of trees),[107]

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[104] Thus, those shaped like earthworms are used for probing abscesses; those like feathered arrows, for raising a spot in order, after incision, to remove a thorn from it (see *infra*, note 111); the hood-shaped ones, for transferring any material from one part to another within the flesh. So Bhā. and Ni.

[105] Ni. adds that in length it is of eight fingers' breadth.

[106] The text has *vēṇikā*, which commonly means 'a braid of hair,' but the commentaries explain it to mean here *guṇa-traya* or 'twine made of three threads,' while *rajju* is said to mean 'thread.' Hair is mentioned further on.

[107] The root-bark or the inner bark (bast) is apparently intended. Ni. says, it is used for bandaging fractures, and adds that it is

(tendrils of) creepers, (pieces of) cloth, large round stones, a hammer,[108] the palms of the hands, the soles of the feet, the fingers, tongue, teeth, nails, and mouth, hair, the ring of a horse's bridle, a branch (of a tree),[109] spittle, fluxing [110] (the patient), making (him) happy, a loadstone; also caustics, fire, and medicines. [11]

(9) With these instruments the whole body may be operated on, that is to say, any one of its limbs as well as its joints, viscera, veins and nerves, according as the case may require. [12]

The operations (that may be performed) with them are of twenty (different) kinds :—Wrenching out, filling (the eyes or bladder etc. with oil), bandaging, raising (or smoothing),[111] curling up, transferring, turning round, exposing (or opening out), pressing, clearing canals, pulling to and fro (or loosening a foreign body), pulling out, pulling up (into its right place), setting upright, bending down, contusing,[112] stirring (with

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taken from such trees as the Palāça (*Butea frondosa*) and Uḍumbara (*Ficus glomerata*), both of which belong to the so-called *pañca-valkala* set of five trees. See *ante*, note 70.

[108] Used for the purpose of moving or loosening foreign bodies impacted in a bone. It may be made of wood or other material. So Nɪ.

[109] Nɪ. explains that a bridle-ring and a branch are required for the extraction of foreign bodies. The branch apparently is put through the ring to afford a stronger pull.

[110] *I.e.*, causing discharges from the bowels, the stomach, or the eye in order to remove foreign bodies or impurities.

[111] The text has *vyūhana*, *i.e.*, 'arranging,' 'placing in proper position.' Both commentaries explain that it means *ūrdhvī-karaṇaṁ, chittvā uttuṇḍitasya uddharaṇ-ārtham*, *i.e.*, 'raising up for the purpose of removing a thorn after incising (the raised-up part).' They add, however, that others explain it by *vāraṅgēṇa anusaraṇam*, *i.e.*, 'smoothing (lit. following up) with the handle (of the instrument, which has been used for the operation)'; that is, after an incision (*e.g.*, after an abscess has been opened and emptied), the handle of the instrument is to be passed over the incised part in order to bring together the lips of the wound.

[112] The text has *bhañjana*, lit. 'breaking' (the continuity of the

a probe), sucking (with a horn or gourd), exploring, splitting, straightening, washing, blowing (powders into the nose), rubbing out (from the eyes, etc.). [13]

So much is certain that, considering the innumerable variety (in the circumstances of) foreign bodies, a sensible physician must be guided by his own intelligence in the choice of the precise mode of application of his instruments (in any given case). [14]

(10) Now there are twelve (kinds of) defects (that may occur) in an instrument. It may be too thick, or it may be made of impure metal, or it may be too long, or too short, or incapable of grasping, or grasping unevenly, or bent, or (of too) soft (material). Their ends may be too straight, or their pin or ends or edges may be too weak. [15]

An instrument which is free from (all) these defects and which is eighteen inches long,—such an one a physician should consider the best and with it he should perform his operations. [16]

(11) A foreign body which is visible, should be extracted with an instrument having the head of a lion or other (wild beast). If it is invisible, it should be extracted with an instrument having the head of a heron or other (wild bird). Moreover it should be extracted slowly and in accordance with (the dictates of) medical science or of one's reason. [17] Because it enters and turns with ease, and also grasps and extracts a foreign body with ease: for these reasons the heron-headed forceps is the best, and for the same reasons it can be applied, without any harm, to any part (of the body). [18]

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tissues). Bhā. explains that it refers to *çalya-karm-ādēr=mardana* or 'the contusing of a part before it is surgically operated on,' or, as Ni. puts it, *samantatō mardana*, i.e., 'contusing (a part) all round or all over.' But Ni. prefers its own alternative explanation that the term means *çiraḥ-karṇ-ādēr=āmardana* or 'well rubbing the head, ears, etc.'

THE EIGHTH CHAPTER.

On the Application of Cutting Instruments. [1]

(1) There are twenty (varieties of cutting) instruments. They are as follows: [118]

1, *Maṇḍal-āgra* or 'circular-headed,' [with a length of six *aṅgula* or fingers' breadth. There are two sub-varieties, one with a circular edge, the other shaped like a razor].

2, *Kara-patra*[114] or 'a saw,' [with a length of twelve fingers' breadth].

3, *Vṛddhi-patra* or 'a razor.' [The handle should have a length of five and a half fingers' breadth, and the blade, one and a half, the total instrument being seven fingers' breadth long. It has two subvarieties, one with a curved, the other with a resected point. The former is what is called a *kṣura* or 'razor.']

4, *Nakha-çastra* or 'nail-parer,' [with a blade two fingers' breadth long and one finger's breadth broad, the total length of the instrument being eight fingers' breadth.]

5, *Mudrikā*, a cutting instrument of the size of the last phalanx of the index finger.

6, *Utpala-patra*, a cutting instrument resembling the petal of the blue lotus.

7, *Ardha-dhāra*, or 'a single-edged' knife. [Its total length is eight fingers' breadth, and its blade measures two fingers' breadth in length, and at its broadest, one finger's breadth.]

8, *Sūcī*, or 'needle,' [of a length of two to three fingers' breadth.]

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[118] The information, enclosed within angular brackets in the following list, is extracted from the two commentaries and has been inserted in the text for the sake of convenience. See also below, § 5.

[114] Literally: 'having a blade in the form of a hand,' the fingers representing the teeth of the saw.

9, *Kuça-patra,* an instrument shaped like the leaf of Kuça grass (*Eragrostis cynosuroides*). [Its handle is three fingers' breadth long.]

10, *Āṭī-mukha,* an instrument shaped like the beak of the Āṭī bird (*Turdus Ginginianus*). [Its blade is one, and its handle, seven fingers' breadth long.]

11, *Çarārī-mukha,* a kind of scissors resembling the face of the Çarārī bird.[115]

12, *Antar-mukha,*[116] a kind of scissors with semi-circular claws, the insides of which are filled up with straight, cutting blades. [Its length is eight fingers' breadth.]

13, *Trikūrcaka* or 'a three-edged' instrument, a trocar. [The whole is eight, and the handle five fingers' breadth long; the distance between the edges is that of a grain of rice.]

14, *Kuṭhārikā* (lit., axe-shaped), an instrument like a gum-lancet. [Its handle has a length of seven and one-half, and its blade, of one-half fingers' breadth; the latter has the shape of a cow's tooth.]

15, *Vrīhi-mukha,* or a trocar shaped like a grain of rice. [Its full size is six fingers' breadth, the handle being of two, and the blade of three fingers' breadth. Its head is shaped like a grain of rice with a very fine point.]

16, *Ārā* or 'awl' [resembling a shoemaker's awl; sixteen fingers' breadth in total length, with a sharp end of the size of sesamum seed.]

17, *Vētasa-patraka,* an instrument shaped like the leaf of the rattan. [The blade is four fingers' breadth in length, one finger's breadth thick, and very sharp; the handle is also four fingers' breadth long.]

18, *Vaḍiça,* an instrument shaped like a fish-hook. [Its total length is six fingers' breadth, its hook being one-half and its handle five and a half fingers' breadth.]

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[115] Ni. says that this is a bird with a long beak. There are two varieties of it: one with white shoulders, the other with a red head; it is the former kind which is called *Çarārī* or *Çarālī*.

[116] Literally: 'having (blades) in the interior of the mouth.'

19, *Danta-çaŋku* or ' tooth-pick.' [It may be used for cleaning the teeth from tartar and broken bits. Its head is one-half finger's breadth long. It is quadrangular, and with a sharp edge; and in the upper part of its handle it is like the *vrīhimukha.*]

20, *Ēṣanī* or 'probe.' [2]

(2) The *maṇḍalāgra* and *karapatra* are principally[117] used for cutting through and scarifying; the *vṛddhipatra, nakha-çastra, mudrikā, utpalapatraka,* and *ardhadhāra,* for cutting through and cutting into;[118] the *sūcī, kuçapatra, āṭīmukha, çarārīmukha, antarmukha,* and *trikūrcaka,* for evacuating (abscesses, etc.); the *kuṭhārikā, vrīhimukha, ārā,* and *vētasapatra,* for puncturing, also the *sūcī;* the *vaḍiça*[119] and *dantaçaŋku* for extracting; the *ēṣaṇī,* for probing and evacuating;[120] and the different kinds of *sūcī,* for sewing. This enumerates the eight kinds of surgical operations for which *çastra* or 'cutting instruments' are used. [3]

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[117] *I.e.*, they may be used also for other suitable purposes, as indicated by the particle *ca* 'also.' So Nɪ. and Bʜā.

[118] The text has *chēdana* and *bhēdana:* the difference indicated is that of deep and superficial incision. The former means 'cutting through,' 'section,' and includes also the operations of dividing and excising. The latter means 'cutting into' and includes both opening and incising. *Vyadhana* means 'puncturing' and 'perforating.'

[119] A *vaḍiça* or 'fish-hook-shaped instrument' is also mentioned among the *yantra* or 'blunt instruments' (see Chapter VII, § 7). The reason is obvious: it must be made either blunt or sharp according to the purpose for which it is intended. But both Bʜā. and Nɪ. explain that as a *yantra* or 'blunt instrument' it may be of any suitable size, while as a *çastra* or 'cutting instrument' it must be of the fixed size of six fingers' breadth, and have a sharp point. They add that for a similar reason also the *ēṣaṇī* or 'probe' is mentioned among both kinds of instruments.

[120] The text has *ānulōmya* by which, as the commentaries explain *visrāvaṇa* or 'evacuating' is intended, not 'serving as a guide' (as Dr. U. C. Dutt translated), which is not any 'surgical operation.'

(3) We shall now briefly explain the mode of holding these instruments (when they are used) in any operation. The *vṛddhi-patra* should be held at the junction of the blade and handle; in fact, all instruments used for an incision (should be held in this way). The *vṛddhipatra* and *maṇḍalāgra*, when used for scarifying, should be held with the hand a little raised: when used for evacuating (abscesses) they, and in fact all instruments, should be held by the forepart of the handle. In the case, however, of children, of old or delicate or timid men, of women, and of kings and princes, an evacuation should be made with the *trikūrcaka*. The *vrīhimukha* should be held with the thumb and forefinger, and with its handle covered within the palm. The *kaṭhārikā* should be held in position with the left hand, and struck with the middle finger and thumb of the other hand held firmly together. The *ārā*, *karapatra* and *ēṣaṇī* should be held at their extremities. The remaining instruments should be held according to the requirements of each case. [4]

(4) As to the shapes of the instruments they are, in a general way, indicated by their names.

(5) As to their dimensions, the length of the *nakha-çastra* or 'nailparer' and the *ēṣaṇī* or 'probe' is eight fingers' breadth, that of the *sūcī* or 'needles' will be given (hereafter).[121] The rest of the instruments are six fingers' breadth in length.[122] [5]

(6) The good points in an instrument are the following: it should have a well-made handle, it should be made of good iron, and it should have a fine edge, a pleasing shape, and a well finished end, and it should not be fearful to look at. The edge

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121 *I.e.*, in Chapter XXV, on the various kinds of surgical operations. According to Nɪ. some insert here the following direction: "the *mudrikā* is of the size of the last phalanx of the index finger; the *çarārī-mukha* has a length of eight fingers' breadth and is also called *karttarī* or 'scissor.'"

122 The text of this paragragh [5], as given in Jīvānanda's edition, is quite out of order. The true text, as shown by the commentaries and by the logical order of the subjects of the paragraphs, is given in the edition of Kavirāj Gaŋgāprasād Sēn, and is adopted in my translation.

of instruments, used in incising, should be of the fineness of a Masura *(Ervum Lens)*; of those used in scarifying, of half a Masura; of those used in puncturing and evacuating, of a hair; and of those used in dividing, of half a hair.[123] As to the *vadiça* or 'hook' and the *danta-çaŋku* or 'toothpick,' the former should have a curved end and a fine point, while the latter should have an end shaped like the first leaf of barley. An *ẽṣaṇī* or 'probe' should, with regard to its end, be shaped either like an earthworm, or like the previously mentioned instruments (*i.e.*, the hook and toothpick).[124] On the other hand, the defects in an instrument are the following eight: if it is bent, or blunt, or jagged, or too thick or too thin, or too long, or too short. Hence instruments which are free from these defects should be used. The *kara-patra* or 'saw' is the only exception; for, being used for the purpose of cutting through bones, it must have a jagged edge. [6]

(7) The tempering of these instruments may be done in three ways: by means of an alkaline solution, or of water, or of oil. Those tempered in an alkaline solution are used in excising arrows and foreign bodies, and in dividing bones: those tempered in water are used in excising or incising[118] or cleaving muscles: those tempered in oil, are used in puncturing veins and dividing nerves or tendons. For sharpening these instruments a smooth bone of the colour of Māsa (*Phaseolus Roxburghii*) should be used, and for preserving their edge, a case made of the wood of Çālmalī (*Bombax malabaricum*). [7] Here comes in (the following verse) :—

> When an instrument (has been selected) of a good make and with an edge so keen as to divide the hairs on the skin, and when it has been grasped at the proper place [see *ante*, § 3], only then it may be employed in any surgical operation. [8]

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[123] Nɪ. here points out, that the fineness of the edge will vary, according as the same instrument (*e.g.*, a *vṛddhi-patra* or 'knife') is used for an incision or an excision.

[124] This variety in shape of the probe is, as the commentaries explain, expressed in the text by the particle *ca* 'and,' which is omitted in Jīvānanda's edition.

(8) Substitutes for cutting instruments are the following: bamboo, crystal, glass, ruby, leeches, fire, caustic, the nails, leaves of Gōjī (*Elephantobus scaber*) or Çēphalikā (*Nyctanthes Arbor-tristis*) or Çāka (*Tectona grandis*),[136] young shoots, hairs, and the fingers. [9]

These substitutes may be used in the case of infants or of persons who are afraid of surgical instruments, or when such instruments are not available. The (first-named) four objects, bamboo, crystal, glass, and ruby, should be used for cutting through or cutting into[118] some part. [10] The nails should be used, if those two operations as well as that of extraction can be done with them. The mode of using caustics, fire, and leeches will be explained subsequently. [11] If there is any formation of pus in the mouth or the eyelids, it may be evacuated with the leaves of Gōjī or night-jasmin or teak. In default of probes hairs or the fingers or a young shoot will be found useful for exploring. [12] A wise physician will get all these instruments made of pure iron and with sharp edges, by a blacksmith who is skillful and experienced in his craft. [13] A physician who knows the use of cutting instruments always attains success; hence one should not fail to acquire experience in their handling. [14]

THE NINTH CHAPTER.

On Practical Training in Surgical Operations. [1]

(1) Even when a pupil has learned the whole of the medical text books, he must still be made to acquire practical proficiency. He must be instructed practically how to perform surgical opera-

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[136] According to both commentaries Gōjī is either the same as Gōjihvā (*Elephantobus scaber*) or Çākhōṭaka (*Streblus asper*). Çēphalikā is the 'night jasmine,' and Çāka is the Teak tree. The leaves of all these are used as vulneraries in the form of an epithem.

tions and how to apply oils and other (medicaments). However great his theoretical knowledge may be, unless he acquires also practical skill, he will never be a proficient in his surgical practice. [2]

(2) Now every kind of deep incision as well as the operations of excising and dividing may be shown (to the pupil) on pumpkin-gourds, bottle-gourds, water-melons, and various kinds of cucumbers.[126] The operation of superficial incision (or opening) may be shown on leather-bags, bladders and pouches, filled with slush: scarification, on stretched pieces of leather covered with hair: puncturing, on the veins of dead animals or on stalks of the water-lily: probing, on the apertures of worm-eaten wood, bamboo, reed, any tubular object, or dried bottle-gourds: extracting, on the pulp of the jack-fruit, the bel-fruit, or the Vimbī-fruit (*Cephalandra indica*), or on the teeth of dead animals: evacuating (abscesses), on a lump of wax applied to a board of Çālmalī wood (*Bombax malabaricum*): sewing, on the ends of two thick pieces of cloth or of two pieces of soft leather: bandaging, on the various large and small limbs of a human figure made of cloth or clay, etc.: bandaging the root of the ear, on a piece of soft flesh or the stalk of a water-lily: applying the actual and virtual cautery, on pieces of soft flesh: introducing catheters, and compressing abscesses (formed) within the abdominal cavity, on the spout of an earthen vessel filled with water, or on the mouth of a bottle-gourd or similar objects. [3] Here come in (the following verses) :—

> An intelligent physician who acquires a practical knowledge of surgery by operating on these and similar suitable objects, in the manner above explained, will never go wrong in any of his operations. [4] Hence, if he wishes to attain proficiency in the use of cutting instruments, and of the virtual or actual cautery, he should acquire a practical knowledge of the several operations by practising them on those objects which have been above shown to be respectively suitable for them. [5]

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[126] The text mentions three kinds: Trapusa or *Cucumis sativus*, Ērvāru or *Cucumis utilissimus*, and Karkāru or *Cucumis Melo*.

THE TENTH CHAPTER.

DIRECTIONS FOR VISITING A SICKROOM.

(1) After having learned his text-book and understood its meaning, and after having seen operations performed and acquired practical skill in them himself, in short after having mastered the whole subject of medical science, (the candidate) should obtain the king's permission (to practise). Then, after having cut his nails and hair, bathed and dressed in clean clothes, taken an umbrella and a stick in his hand, and put on shoes, simple in attire and good at heart, with polite address and without ostentation, friendly inclined towards all creatures, and accompanied by a trusty attendant, he may now undertake to visit a sickroom. [2]

(2) At a time when the messenger, the weather, the (behaviour of the) kites and other auguries[127] are favourable, he should go to visit the patient's house, and having entered it, he should view the patient, touch him, and question him. By these three modes of examination some say that most diseases can be diagnosed. But this is not correct. There are six modes of diagnosing diseases; namely by the five senses, *i.e.*, hearing, etc., and by questioning. [3] As symptoms discernible by the sense of hearing such as these may be mentioned: in diseases, characterised by a discharge from an abscess, air escapes with a noise, bringing out with it frothy blood. Symptoms discernible by the sense of touch are coolness or heat, smoothness or roughness, softness or hardness, and other tangible qualities (of the skin) in fever, consumption, and other (diseases). Symptoms discernible by the sense of sight are corpulence or emaciation, vitality, characteristic remarks, energy, change of colour, and so forth (of

[127] The text has *nimitta* and *maṅgala*, two words of a very general character for 'omen' or 'good omen.' The commentaries refer the former to metereological conditions, such as an agreeable breeze, and the latter to such objects, as the *svastika* or 'cross,' a vessel full of water, etc.

the patient). Symptoms discernible by the sense of taste[128] are the various tastes noticeable in morbid secretions of urine and other diseases. Symptoms discernible by the sense of smell are the odours emanating from inflammatory or non-inflammatory states (appearing) on the approach of death or similar conditions. By questioning, (the physician) may ascertain the (patient's) country,[129] time,[130] caste, habits and diet,[131] the cause of his disease, the nature of his pain, his strength and appetite, the regularity or irregularity in his passing of wind, urine and fæces, the duration of his disease, and similar particulars. Seeing that there is a similarity between the (six) modes of examination and the (derangements of the three) humours, the physician is in a position to diagnose a disease from its symptoms corresponding (severally with the six modes of examination).[132] [4] Here come in (the following verses):

Diseases which are wrongly observed, and badly des-

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128 Ni. explains that this does not refer to the sense of taste of the physician, but of bees, ants, and similar insects who are attracted by urine. (See note 133).

129 The country may be either *jāṅgala* 'wild,' or *anūpa* 'marshy, or of the ordinary kind. So Ni.

130 Time may be considered either from the permanent (*nityaga*) or accidental (*āvasthika*) point of view. The former refers to the climatic conditions of the patient's country. The latter refers to the patient's age, or the circumstances of his disease, such as when his fever comes and goes, etc. So Ni. and Bhā.

131 The text has *sātmya*, lit. 'what is conducive to health' or 'hygiene.' Under this head the commentaries explain that the physician should enquire into both the patient's habits and his diet.

132 This is a rather difficult clause. Bhā. does not explain it at all, and it evidently did not exist in its recension of the text (see below, note 133). In my translation I have followed Ni.'s explanation. Ni. takes *ātman* to mean *dōṣa* or 'the (three) humours,' which is an unusual meaning, but I know nothing better: *ātman* often means *çarīra* 'body,' and this might be made, though not so well, to fit in with Ni.'s explanation. The argument of the clause is as follows. There are six means of diagnosis: the five senses and questioning. Similarly there are six kinds of symp-

cribed, and badly examined by touch, will confound the physician.[183] [5]

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toms of the deranged humours, namely five sensible (audible, visible, tangible, tasteable and smellable symptoms), and one ascertainable by questioning. Morever these six kinds of symptoms vary according as the derangement is of bile or phlegm or air. Seeing that there exists this similarity between the two sets, the physician is thereby enabled to identify the symptoms of derangement of any of the three humours, and thus to identify the disease itself which is caused by the deranged humours. Thus, in the case of derangement of the bile, the sores due to it are known by touch, the yellowish colour due to it, by the eye, the sourish taste due to it, by taste, the pungent smell due to it, by the nose, the biting and burning sensations due to it, by questioning. And so forth, in the case of other deranged humours.

[183] There is here a distinct trace of an older recension. This verse clearly refers to the same threefold means of diagnosis (sight, touch, questioning) which are mentioned above in §[3], and there declared to be incorrect. The latter part of §[3], and the whole of §[4], are an interpolation of a later revisor. The original recension evidently still existed in the time of the commentator Cakrapāṇidatta whose commentary, the Bhānumatī, shows that he read the text as follows: §[3]......*prāyaçō vēditavyāḥ* ‖ §[5] *bhavati c=ātra* | *mithyā-dṛṣṭā vikārā hi dur-ākhyātās=tath=aiva ca* | *tathā duḥ-parimṛṣṭāç=ca mōhayēyuç=cikitsakam* ‖ 1 ‖ *tasmāt=parīkṣyāḥ satataṁ bhiṣajā siddhim=icchatā* | *yukty=aiva vyādhayaḥ sarvē pramāṇair=darçan-ādibhiḥ* ‖ 2 ‖ His recension omitted the last two clauses of §[3] and the whole of §[4]. It added, on the other hand, one verse to §[5]. On this text, as he read it, Cakrapāṇidatta remarks that the word *prāyaçō* as well as the particle *ca* 'and,' appended to *pṛcchēt* in the preceding clause, indicate that, besides the senses of sight and touch, also the senses of smelling and hearing as well as *anumāna* or 'inference' are admissible as means of diagnosis. He explains that 'inference' is necessary, because the sense of taste cannot be exercised by the physician on the patient directly; he must do it through the intermediacy of ants from whose attraction by the urine he infers the presence of sugar in urinary diseases (see note 128). He then quotes Caraka as saying both that "there are three modes of examination, by sight, touch, and

(3) Having thus fully examined a disease, the physician should undertake the cure of curable diseases, and the relief of the relievable ones, but the incurable ones he should not attend to; also diseases which have existed for more than one year, he should avoid to treat. [6] But even curable diseases of the following persons are, as a rule, most difficult to treat; namely: Brāhmans learned in the Vēdas, kings, women, children, old and timid persons, royal servants, gamblers, physically weak people, contemners of physicians, concealers of their diseases, poor, stingy, and irascible people, also people incapable of self-control, and such as have no natural protectors.[134] The treatment of these a

questioning," as well as that "there are two modes of examination, by observation (*pratyakṣa*) and inference (*anumāna*)." The latter, he explains, means that observation refers to sight and touch, while inference refers to the other senses. Ḍallaṇa Miçra, in his commentary, the Nibandha Saŋgraha, further states that the Pañjikāra (*i.e.*, Gayādāsa) read the text exactly as Cakrapāṇidatta did, and declared that those who held "a sixfold mode of examination did not properly understand the text-book." The additional verse, which is above quoted from the original recension, may be thus translated: 'hence a physician who is desirous of success must always examine every disease in the light of the evidence afforded by sight, touch, and questioning, and not omit to use his reasoning powers.' The phrase *yuktyā ēva* lit., 'even together with reasoning or inference' may be noted. It leaves sufficient room for any evidence afforded by smell, sound, and taste. The older recension appears to me to have for itself the preponderance of authority; but as the newer recension only is now found in the printed texts, I have followed it in my translation.

[134] The reasons why these persons are difficult to treat are thus given by Ni.: the Brāhmans on account of their predisposition to illness through the frequency of their ceremonial ablutions; kings on account of their intolerance of a prescribed regimen, or their delicate constitution; women, on account of their reluctance to disclose their diseases or to submit to enemas, etc.; the young and aged, on account of their delicate constitution and consequent inability to bear surgical or medical applications; the timid, on account of their reluctance to submit to medical treatment; royal servants, on account of their not being master of

physician should only undertake with great care: then he will secure for himself merit, wealth, pleasure, and fame. [7] Here comes in (the following verse):

> A good physician will avoid to be alone, or sit close to, or to jest with women; nor will he accept any present from them excepting only articles of food. [8]

THE ELEVENTH CHAPTER.

On the Preparation and Use of Caustics. [1]

(1) Of all cutting instruments and their substitutes [see chap. 8, § 8] caustics (or vegetable alkalis) are the most important, because by means of them deep and superficial incisions [see note 118] and scarifications may be made, derangements of the three humours (air, bile, and phlegm) may be rectified, and some diseases can be treated with special advantage.[135] [2] *Kṣāra* or 'caustics,' are so called because they are a means of attenuating (*kṣaraṇā*) or destroying (*kṣaṇana*) (deceased skin, muscles, etc.). On account of various kinds of medicinal plants entering into their composition they serve to rectify the three humours when deranged.[136] On account of their white colour, their nature is lunar (*i.e.*, cooling); but this fact, is by no means inconsistent

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their time; gamblers, on account of their absorbing attachment; the weak, for the same reason as the young and aged; contemners of physicians, because they are too conceited to abide by the prescribed regimen; concealers of their diseases, because they will not speak out; the poor, on account of their inablity to purchase medicines; the stingy, because they grudge the cost of medicines; the irascible, because their ebullitions of anger intensify their diseases; the incapable of self-control, because of their indulgence in unwholesome things; those who have no natural protectors (*i.e.*, widows and orphans), because they have no one to attend to them.

[135] Ni. explains that this refers to the case of hæmorrhage (*rakta-pitta*) and piles (*arças*).

[136] Ni. adds that for the same reason they are also useful in the treatment of hæmorrhage and piles. See preceding note.

with their power of burning, maturing and tearing:[137] indeed, on account of the large number of heating medicaments (which enter into their composition) they are acrid, hot and pungent. Their (external) use promotes suppuration, corrosion, depuration, granulation,[138] desiccation, hæmostasis, and scarification. Their (internal) use cures worms, acidity, deranged phlegm, skin-diseases, poisonings, and obesity. An excessive use of them induces impotence. [3]

(2) Potashes are of two sorts: for external application, and for internal administration. Their external use is indicated in the case of skin-diseases, keloid, ringworm, leucoderma, lepra, fistula-in-ano, tumours, unhealthy sores, sinuses, condyloma, black moles, chloasma, brown spots on the face, and warts; also in the case of abscesses, worms and poisoning (both on the surface); also of the (following) seven diseases of the mouth: tumour under the tongue (or ranula), tumour on the tongue, inflammation of the gums, inflammation due to external injury, and three kinds of *rohiṇī* or inflammation of the throat; in these (seven) cases only, caustics should be applied as a substitute of cutting instruments.[139] Their internal use is applicable in the case of chronic or slow poisoning, abdominal tumours, abdominal enlargements, cessation of digestion, indigestion, want of appetite, constipation, urinary deposits, calculus, deep-seated abscesses, (intestinal) worms, (internal) poisoning, and piles. [4] Their (internal administration) is unsuitable in the case of persons who have a tendency to (internal) hæmorrhage and bilious fever, of children, and old or weak people; also in the case of persons suffering from giddiness, frenzy,[140] fainting, amaurosis, or other

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137 Ni. points out that intense cold (*himānī*) has the same effect as great heat.

138 The commentaries say that some omit *rōpaṇa* or 'granulation,' because (they say) a healthy sore granulates by itself, and does not require any caustic to promote it; a caustic may rather prove noxious.

139 The commentaries explain that there are five kinds of *rōhiṇī*, but two of them are incurable.

140 Caused by poisoning, intoxication, derangement of the blood, or eating of (fresh) betel nuts: so Ni. On the poisonous proper-

similar diseases. Caustics for internal use are prepared in the same way as those for external use, by burning and straining. The details (of the method of their administration) will be given elsewhere.[141] [5] Caustics may be made of three strengths: weak, moderate, and strong.

(3) He who wishes to prepare a caustic, should, on an auspicious day in the autumn, after purifying himself and fasting, (select) a large-sized, middle-aged, uninjured[142] Muṣkaka tree (*Stereospermum suaveolens*), bearing dark flowers[143] and growing on an auspicious spot[144] on a (lonely) mountain, and perform the *adhivāsana* or 'preliminary ceremony,' saying the following incantation[145] :—

"Oh thou tree of fiery power! thou of great power! may thy power not be lost! Oh thou auspicious one, stay

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ties of the Areca Catechu, see Pharmacographia Indica, Vol. III, p. 524. It is especially the fresh nut which causes intoxication, and the sensations of strangling and giddiness.

141 The commentaries refer to the chapter on *gulma* or abdominal tumours, and subsequent chapters; *i.e.*, to Part VI (*Uttaratantra*), chapter 42 ff., where a number of formulae will be found, into the composition of which various kinds of caustics enter. The commentaries, however, add that, in the case of caustics for internal use, the second boiling is omitted, and the measures for their three strengths are one pala, three karṣa (or three-quarter pala), and half a pala of alkaline ashes respectively.

142 By fire or insects: so the commentaries.

143 The Muṣkaka tree is also called *Ghaṇṭāpāṭali* or *Ghaṇṭāpārali*. It is probably a variety, with particularly dark-coloured flowers, of the Pāṭali or *Stereospermum suaveolens*, which has dark, dull-crimson flowers, and a campanulate calyx, and is sacred to Durgā. BHĀ. quotes from Viçvāmitra the following verse: 'there are four varieties of Muṣkaka with white, dark (*kāla*), red and yellow flowers, among them the dark-flowered one is considered the best.'

144 *I.e.*, in which there are no holes (*çvabhra*) nor any burying place, etc. So BHĀ.

145 The *adhivāsana* is an oblation (*bali-karman*) accompanied with an incantation (*mantra*). According to the commentaries, Bhōja

even here and accomplish my work! When once my work is done, then thou mayest go to heaven!"

After which he should make an oblation with a thousand white flowers. At daybreak (of the next day), if he observe no change (in the tree) nor any marvel,[146] he should proceed as follows.[147] He should cut down suitable pieces (of the tree), and having

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gives the following directions and incantation: 'he should there, with his face to the east, offer an oblation, and then, on all four sides, with joined palms, devoted mind and pure body, addressing the tree, repeat (the following words): "Whatever spirits may inhabit this tree, let them depart hence; for to-morrow this tree is to be cut for a high object!"'

146 *I.e.*, if no branches are broken or other damage done; and no shower of blood (*rudhira-varṣa*) has fallen. So the commentaries.

147 In the above given translation I have adopted the older recension which, to judge from Cakrapāṇidatta's commentary, appears to have been contained in the copy of Suçruta which he annotated. As it is not to be found in any of the modern editions of Suçruta, I give it here, reconstructed from the commentaries. In the edition of Kavirāj Gaṅgāprasād Sen, an attempt to do so is made, but it is given in an imperfect form. It runs as follows:

... *adhivāsy=ābhimantry=ānēna mantrēṇa* | *agnivīrya* etc. up to *gamiṣyati çvēta-puṣpaṁ sahasraṁ juhuyāt* ‖ *prabhātē vaikṛtam=adbhutaṁ na paçyēt tad=upakalpayēt* | *khaṇḍaçaḥ prakalpy=āvapāṭya nirvātē dēçē citiṁ kṛtvā tila-nālair=ādīpayēt* ‖ etc.

The later and ordinary recension is given in Jīvānanda Vidyāsāgara's and other editions. Its translation will run thus:

'... and perform the adhivāsana ceremony. On the following day he should cut down the tree with the following incantation: "Oh thou tree of fiery power" (etc., as above in the text); after which he should offer an oblation with a thousand white and a thousand red flowers. He should then cut the tree into suitable pieces' (etc., as above in the text).

This later recension makes the whole tree, "a large-sized one," to be cut down, while the older recension only directs pieces of it to be lopped off. For the case in hand (merely preparing some alkaline ashes) the latter is obviously the more rational one; accordingly I have preferred it.

piled them for burning in a spot sheltered from wind,[148] he should set fire to them with stalks of Sesame. When the fire has burned out, he should collect separately the ashes of the wood and the nodules of the ashes.[149] [6] In the same way the following trees may be burned, including their branches, leaves, fruit, and roots:[150]

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[148] According to Ni., one recension of Suçruta interpolates here *sudhā-çarkarāç=ca prakṣipya*, i.e., 'and having thrown in some limestone,' and afterwards substitutes *kaṭa-çarkarāç=ca* or 'excess of (lime-)stone' for *bhasma-çarkarāç=ca* or 'nodules of ashes.' Bhā. knows nothing of this recension: apparently in Cakrapāṇidatta's time it did not yet exist. In the modern editions of Jīvānanda, Avināça Candra Kaviratna, and Gangāprasād Sen, confusedly, the interpolation is adopted, but not the substitution. Besides "excess of lime-stone" is a very forced interpretation of the word *kaṭa-çarkarā* which is otherwise only known as a name of the Bonduc-nut; see below §[9].

[149] The *bhasma-çarkarā* or 'nodules of ashes' are thus explained by Bhā. from the Nighaṇṭa: "When during the burning of the (green) Muṣkaka wood, its sap exudes, it forms hard particles with the ashes; these particles are called 'nodules of ashes.'" According to the commentaries, these nodules are collected separately, in order to be used in a subsequent stage of the preparation of the alkaline lye. See below §[9].

[150] This does not mean (as it appears to have been misunderstood by some) that the whole tree should be cut down and burnt, but that any part of it may be used; the remark has evidently special reference to the case of climbing plants (such as the *Kōṣātakī*) which would afford but little wood. The commentaries here speculate on the reason why the *Muṣkaka* is mentioned separately. They give two alternative explanations. (1) Either *Muṣkaka* by itself, or a mixture of all the others (*Kuṭaja*, etc.) together, may be used to prepare ashes. (2) All the plants (*Muṣkaka* as well as Kuṭaja, etc.), in combination, must be used, but in that case one-half of the ashes must be of *Muṣkaka*, while the other half should be of *Kuṭaja* etc. combined. Bha. seems to prefer the former, while Ni. adopts the latter alternative.

Kuṭaja	*Holarrhena antidysenterica* (Conessi bark),
Palāça	*Butea frondosa* (Bastard Teak),
Açvakarṇa	*Shorea robusta* (Sâl tree),
Pāribhadraka[161]	*Erythrina indica* (Coral tree),
Vibhītaka	*Terminalia belerica* (Beleric myrobalan),
Āragbadha	*Cassia Fistula* (Indian Laburnum),
Tilvaka	*Symplocos racemosa*,
Arka	*Calotropis gigantea* Gigantic Swallowwort),
Snuhi	*Euphorbia neriifolia*
Apāmārga	*Achyranthes aspera* (Prickly Chaff-flower),
Pāṭalā	*Stereospermum suaveolens*,
Naktamāla	*Pongamia glabra*,
Vṛṣa	*Adhatoda Vasica* (Malabar-nut tree),
Kadalī	*Musa paradisiaca* (plantain),
Citraka	*Plumbago zeylanica*,
Pūtīka	*Caesalpinia Bonducella* (Bonduc-nut),
Indravṛkṣa[162]	*Wrightia tinctoria*,
Āsphōta[163]	*Salvadora persica*,
Açvamāraka	*Nerium odorum* (Oleander),
Saptacchada	*Alstonia scholaris*,
Agnimantha	*Premna integrifolia*,
Guñjā	*Abrus precatorius* (Jequirity),
Four varieties of Kōśātakī[164]	*Luffa*. [7]

161 According to the commentaries, this may also be the Deodār (Cedrus Deodara).

162 Dr. U. C. Dutt identifies this with *Terminalia Arjuna*. But Ni says that it is a kind of Kuṭaja, of which there are two varieties: one with brownish flowers, the other with white flowers. Dr. Dymock's Pharmacographia Indica, Vol. II, p. 397, says that the *Wrightia tinctoria* is often confounded with and substituted for *Holarrhena antidysenterica*, but that it has "white jasmin-like flowers."

163 This is the identification given by Dr. U. C. Dutt. Ni., however, identifies it with Sārivā (*Hemidesmus indicus* or *Ichnocarpus frutescens*). Bhā. does not explain it. Both Sārivā are climbing plants.

164 According to the commentaries these are: 1, with large fruit,

Next one drōṇa of the ashes should be stirred into six drōṇas of water or of the prescribed kind of urine,[155] then strained (through cloth) twenty-one times, and finally boiled slowly in a large pan, agitating it (all the time) with a ladle. When (the fluid) becomes clear, red-coloured, pungent, and soapy to the touch,[156] it should be taken off (the fire), strained through a large piece of cloth, and placed once more on the fire, while the residium may be thrown away. Of the alkaline water, thus obtained, (eventually) either one kuḍava (*i.e.*, 8 pala) or one kuḍava and a half (*i.e.*, 12 pala) will have to be taken.[157] [8] In the meantime some Bonduc-nuts, nodules of the ashes [see note 149], bivalve-shells and conch-shells, after having been made red-hot in an iron vessel,[158] should be thrown into the afore-mentioned (8 or 12 pala of) alkaline water, crushed to powder, and stirred into a paste. Then this paste should

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2, with small fruit, 3, with yellow flowers, 4, with white flowers. They are all climbing plants or vines.

[155] *I.e.*, of a cow. The reference is to the 1st paragraph of the 7th chapter of the Kalpasthāna (or 5th section); [see page 640, line 16, of Jīvānanda's edition]. So NI. But the reference in BHĀ. is to the division on urine in the 45th chapter of the Sūtrasthāna (or 1st section), where the urine of a number of other animals is also permitted; [see paragraph 1 on page 191 of Jīvānanda's edition.] The latter reference is undoubtedly the correct one.

[156] This stage is generally reached when the fluid is decocted to one-fourth, or according to others, to one-third of its original quantity. So the commentaries. See below note 159.

[157] In the case of fluids the equation of the quantities is doubled. Thus for solids or dry substances one kuḍava is equal to 4 pala, while for fluids it is equal to 8 pala. See paragraph 8 in chapter 31 of the Cikitsāstāna (or 4th Section), page 538 of Jīvānanda's edition.

[158] BHĀ. says that an iron vessel is used either because of its hardness, or because the iron enhances the strength of the preparation. The English word *potash* is said to be "derived from the circumstance that the water in which the ashes are washed is evaporated in iron pots."

be superadded to that afore-mentioned decoction[169] and (the whole) should be boiled under constant, attentive agitation

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[169] I read *tēn=aiva prativāpya*, i.e., 'having superadded to that very (decoction).' The commonly printed recension reads *tēn=aiva dvi-drōṇē 'ṣṭa-pala-sammitaṁ çaŋkhanābhy-ādīnāṁ pramōṇaṁ prativāpya*, i.e., 'having superadded conch-shells etc. at the rate of 8 pala to that very decoction consisting of 2 drōṇa.' Both readings are noted and commented on by BHA. and NI.; and BHA. seems to prefer the reading which I have adopted, and which is clearly, as I shall show, the older and better one. The directions given in the latter are as follows: Of wood-ashes one drōṇa should be taken; ashes being solid, a drōṇa is equal to 256 pala. Of water (or optionally urine) 6 drōṇa must be taken, *i.e.*, six times he quantity of water, *i.e.*, 1536 pala (not 3072 pala, as one might suppose, see note 157; the calculation of both commentaries is explicit on this point). The mixture of wood-ashes and water (or urine) is to be reduced or thickened by decoction: no definite limit is stated; this is left to the physician's discretion; practically the required state of decoction is reached at one-third or one-fourth of the original quantity (see note 156). Of the decocted mixture either 8 pala or 12 pala (here the mode of measuring liquids is adopted, see note 157) may be taken, again at discretion. The commentaries here expressly state that these quantities are mentioned to serve as a guide to the quantities of the extra-ingredients which have to be superadded. Of these extra-ingredients there are four (bonduc-nut, etc). The quantities of these are once more left to the physician's discretion: as BHA., expressly states, more or less of them may be taken, only there should be sufficient to form a paste with 8 or 12 pala of the decoction; thus the latter quantity is a sort of guide. Having prepared this paste of extra-ingredients (the technical term for which is *prativāpa*), it should be thrown into the remainder of the decoction (*i.e.*, into what remains after taking away 8 or 12 pala). The whole is now to be boiled until it reaches the proper state of consistency. Now in course of time, it became the accepted practice to decoct the original quantity of 6 drōṇa or 1536 pala of water (or urine) to one-third, *i.e.*, to 2 drōṇa or 512 pala, and to let the ratio of the quantities of the extra-ingredients be 8 pala. The reason was this: taking 8 pala of each of the 4 extras, we

(with a ladle). Great care must be taken, lest (the solution) becomes too thick or too thin. When it has reached the (proper stage of) boiling, it should be removed (from the fire) to a sheltered place and deposited in an iron jar with its mouth well covered. This (process yields a caustic solution of) middling strength. The same process, but without the addition of any superadded ingredients [*i.e.*, without the paste of bonduc-nuts, etc.], gives a weak solution or (what is called) *saṁvyūhima* or 'a simple mixture.' [9] As extra-ingredients such of the following drugs as are available should be used :—

Dantī	*Baliospermum axillare*,
Dravantī[160]	A kind of Dantī,
Citraka	*Plumbago zeylanica*,
Lāṅgalakī	*Gloriosa superba* (Superb Lily),
Pūtīka-pravāla[161]	Sprouts of *Caesalpinia Bonducella* (Bonduc-nut tree),
Tālapatrī	*Curculigo orchioides*,
Viḍa	Viḍ-salt, black salt,
Suvarcikā	Carbonate of Soda,

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obtain 32 pala, and these are the 16th part of 512 pala; a mixture in these proportions was supposed to give the best potash; the 8th part was supposed to give a middling sort, and the 4th part, a weak sort of potash. When this had become the accepted practice, the text was altered and the above-mentioned passage was interpolated. The commentaries, however, note that some decocted the original quantity to one-fourth, and others, even to one-sixteenth (or $\frac{1536}{16}$ = 96 pala); again others made 8 pala to be the total quantity of the extra-ingredients, *i.e.*, 2 pala of each of the four. All this shows that the original text was drawn so as to leave a wide discretion to the operator.

[160] The identity of this plant is uncertain. The commentaries say that it is a kind of Dantī, which BHĀ. describes as *jīvita-patrā* or 'having living leaves (?)'; but NI. adds that according to Bhādālaka it is the same as *Saṁvarī*. But the identity of the latter is also doubtful; it may be *Salvinia cucullata* or *Anthericum tuberosum*.

[161] NI. says that according to some this is Chirivilva or *Pongamia glabra*.

Kanaka-kṣīrī[162]	A kind of earth of gold colour,
Hiŋga	*Ferula alliacea* (asafoetida),
Vacā	*Acorus Calamus* (Sweet Flag),
Viṣa	*Aconitum ferox* (Indian Aconite),

A çakti (or half a pala) of each of these drugs, in fine powder, will make up the extra-ingredients. The caustic solution prepared with them, is the strongest and (is called) *pākya* or 'the boiled one.'[163]

(4) In the administration of these (three kinds of caustics) account must be taken of the (nature of the) disease and the strength (of the patient). If any caustic solution should loose its power, some fresh alkaline water may be added, by which its strength will be re-gained.[164] [10] Here come in (the following two verses) :—

A caustic should be neither too strong, nor too weak, nor too white ; it should be soft and soapy (to the touch) ;

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162 The commentaries give the synonym *kaŋkuṣṭha*, which suggests the possibility of the proper reading being *kanaka-kṣāra*, as *kanaka-kṣīrī* is only known as the name of certain plants. On *kaŋkuṣṭha*, see Garbe's Indische Mineralien, p. 69, No. 141, foot-note.

163 The text classifies caustics into (1) *saṁvyūhima* or 'weak,' which has no extra-ingredients (*prativāpa*) ; (2) *madhyama* or 'middling' which has the extra-ingredients consisting of paste of bonduc-nut, etc. ; (3) *pākya* or 'boiled,' *i.e.*, extra boiled with an additional set of extra-ingredients consisting of paste of Dantī, etc. BHĀ. quotes the following classification from Bhōja : "Caustics are divided into *saṁvyūhima* or 'weak' and *pākya* or 'boiled,' and the latter are again divided into *sa-prativāpa* or 'middling' (lit., 'with an extra-ingredient') and *tīkṣṇa* or 'strong.'" This is similar to the classification of Suçruta. But BHĀ. also refers to another system of preparation, according to which all three kinds of caustic solutions are made with extra-ingredients, and are distinguished from each other only by the quantities of the latter, these being 4, 8, and 16 parts respectively for the weak, middling, and strong solutions. Compare note 159.

164 The commentaries explain that, after adding the fresh alkaline water, the mixture should be again boiled. A caustic may become ineffective either through lapse of time or through deficiency in ingredients.

it should have only a gentle flow,[165] and (in its action) it should be beneficial and quick. These are declared to be its eight good qualities. [11] On the other hand, its bad qualities are said to consist in its being too weak, too cool,[166] too hot, too strong, too soapy, too spreading, or too thick; also in its being underboiled, or deficient in ingredients. [12]

(5) Now when (the physician) goes to see a patient suffering from a disease curable by a caustic application, he should select (for the operation) a spacious place protected from draughts and the sun, and the conditions previously explained.[167] He should then, after having placed handy all his appliances, examine the patient's (diseased) part, rub it, scrape it, and scarify it, and then with a probe apply the caustic; and having done so, he should wait for the space of time required to utter one hundred words.[168] On the application of the caustic, the diseased part turns black, and this is the sign of its being (properly) burnt. When this occurs, (the application of) any acetic acid,[169] mixed with clarified butter and honey, will give relief. [14]

But if by reason of its being deeply imbedded, the burnt

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165 So that, on application, it does not spread unduly. So the commentaries.

166 Ni. explains *çaitya* by *çuklatā*, 'too white,' but I am not aware that *çaitya* or *çīta* ever has that meaning. See, however, § 1 and verse [11].

167 That is, he should select an auspicious moment of time, as explained in § 3 of the 5th chapter. So the commentaries.

168 I have adopted Ḍallaṇa's recension of this passage, which is adopted in Gaṇgāprasād Sen's edition and runs as follows: *çalākayā kṣāraṁ pratisārayēd=dattvā vāk-çatu-mātram=upēkṣēta.* Cakrapāṇidatta appears to have read *chittvā* for *dattvā* and to have omitted *upēkṣēta*, while the current edition (of Jīvānanda and Avinaça Candra) reads *pātayitvā* for *pratisārayēd=dattvā.* There is no practical difference in meaning.

169 According to the commentaries the reference here is to any of the artificially prepared acetic acids, such as the sour gruels fermented from rice or barley or pulses infused in water. On these see *infra*, chap. 45, §§ [44–47].

part does not (easily) come off, an ointment should be freely applied to it, [15] consisting of a paste made of equal parts of the sediment of *kāñjika* or 'fermented rice-water,' sesamum-seeds, and liquorice. [16] The granulation of the wound may be promoted by a paste made of sesamum seeds, liquorice and a little clarified butter. But how can the fire-like alkaline caustic be neutralised by applying to it the (fermented rice-water with its) equally fire-like, hot, pungent, acid taste? [17] If this is your difficulty, my son, then listen to my explanation. Know that in a caustic all tastes are present except the acid. [18] [170]It has an acrid sub-taste, but its prevalent taste is saline; when joined to an acid (substance), the caustic, with its pungent-saline taste, [19] turns very mild and relinquishes its pungent nature. Through its mildness its (burning) is neutralised, just as a fire, when drenched with water, (is extinguished). [20]

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[170] In the original this is a rather puzzling passage, and perhaps the reading is corrupt. In my translation I have adopted a suggestion of Ḍallaṇa. Cakrapāṇidatta explains: "its prevalent taste is acrid, but it has a saline sub-taste." Ḍallaṇa points out that this cannot be correct: because 1, people take saline things to neutralise acidity in their food; 2, the caustics are treated in the division relating to saline things, but not in that relating to acrid things. A caustic, therefore, is in the main saline; and when in § 1 of this chapter a caustic is said to be acrid, it is only said to be so because a caustic is prepared with *agnēya* or 'heating' medicaments. Hence Ḍallaṇa proposes to construe *anurasa* with *kaṭuka*, and *bhūyiṣṭha* with *lavaṇa*. With the reading as it now stands, such a construction is impossible; that can only be translated: 'it is acrid, but it has a prevalent saline sub-taste'; but a sub-taste can hardly be said to be the prevalent one. Ḍallaṇa's contention, however, seems to me to be right; it agrees with Caraka, who, as Cakrapāṇidatta points out, says *kaṭur=lavaṇa-bhūyiṣṭhaḥ* (*kṣāraḥ*), i.e., 'a caustic is acrid, but in the main saline.' Perhaps the correct reading of the passage should be *kaṭukas=tatr=ānurasō lavaṇa-bhūyiṣṭhas=tathā* (though being an unusual form of çlōka).

Now when the burning (of the afflicted part) is done properly, the disease (for which it was applied) is cured, the system is relieved, and the discharge ceases. When the burning is done insufficiently, there is shooting pain, itching, and insensibility, and the disease increases. When the burning is done to excess, there is burning pain, suppuration, redness, (increased) discharge, pain in the limbs, sense of weariness, thirst, and fainting, and even death may result. The wound, caused by the (insufficient or excessive) burn of a caustic, should be treated according to the (nature of the) deranged humour and of the disease. [21]

(5) The following persons should not be treated with caustics:[171] weak people, children, old and timid people, those who suffer from general anasarca or (internal) hæmorrhage [see *ante* § 2], pregnant and menstruating women, people who are in an advanced stage of fever, who are weakened by phthisis, who are subject to fits of (morbid) thirst and fainting, or who are suffering from seminal exhaustion, or from the displacement downwards or upwards of the testicles or the uterus. [22] Caustics should not be applied to the vital parts, blood-vessels, nerves, joints, cartilages,[172] sutures,[173] *dhamanī*-vessels,[174] throat, navel, inside of the nails, penis, (excretory) canals, and parts thinly covered with flesh,[175] nor to the eyes with the exception of the diseases of the eyelids. [23] But even in the case of diseases curable by (the application of) caustics, these afford no cure to a patient who is subject to fits of anasarca, violent

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171 Either internally, or externally, or both, according to circumstances. So the commentaries.

172 *I.e.*, those of the nose, ear, nape, eye and forehead. So the commentaries.

173 Of these there are seven: five on the cranium, one on the tongue, and one on the perinæum. So the commentaries.

174 On these see below, chapter 9 of the Çarīra Sthāna or 3rd Section. There is nothing exactly equivalent to them in modern anatomy. See also *ante*, note 60.

175 Such as the knee, the upper surface of the foot, the forehead, etc. So the commentaries.

pain in the bones, aversion to food, or pain in the heart and joints. [24] Here comes in (the following verse):—

> In the same manner as poison, fire, sharp weapons, and lightning, caustics, if applied by a careless physician, cause death. When applied properly by a careful physician, they quickly cure (many) serious diseases.

THE TWELFTH CHAPTER.

ON THE MODE OF APPLYING THE ACTUAL CAUTERY. [1]

(1) With regard to surgical treatment, actual cautery is said to be superior to caustics,[176] inasmuch as diseases treated with the actual cautery do not re-appear, and because it can cure diseases which are incurable by medicines, instruments, and caustics. [2]

(2) The means for carrying out the actual cautery are the following: long pepper, goat's dung, orpiment, an arrow-head, or a wick; also oval-headed probes,[177] made of iron or other metals; further, honey, treacle, and the various kinds of oleaginous substances.[178] Of these, long pepper, goat's dung, orpiment, arrow-heads and wicks are used in the case of (diseases) affecting the skin; probes made of iron or other metals (such as copper, silver, etc.) in the case of (diseases) affecting the muscles; and honey, treacle, and oleaginous substances, in the case of (diseases) affecting the blood-vessels, nerves, joints and bones. [3] The actual cautery may be used in all seasons except the autumn and

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[176] The commentaries explain that though in chapter 11, § 1 caustics are said to be superior to all substitutes, including the actual cautery, there is no contradiction here. Each is superior from its own point of view: cautery with regard to effectiveness of treatment, caustics with regard to variety of application.

[177] The text has *jāmbauṣṭha* which is a probe with a head shaped like the oval fruit of the Jambu tree. So BHĀ. See also *ante*, chap. 7, § 7.

[178] These are the following four: oil, clarified butter, fat, and marrow.

summer; and even in these (it may be used) if a rapidly fatal disease cannot be cured without it, provided that suitable precautions[179] are taken. [4] In all diseases and in all seasons the actual cautery should be performed on a patient only after he has been kept on a mucilaginous diet, but in the case of complex labour, stone in the bladder, fistula-in-ano, piles, and diseases of the mouth, (it should be performed on him) on an empty stomach. [5]

(4) Some say that there are (only) two kinds of cautery, namely that of the skin and that of the muscles; but here (in this treatise) there is no prohibition against the cauterization of blood-vessels, nerves, joints and bones.[180] [6] When the skin

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179 The commentaries explain that this refers to cool cloths and diet, as suitable to those two hot months.

180 According to BHĀ. and NI. the reference is to Kāçyapa from whom they quote the following verse: "under no circumstances should the irritating part be surgically removed from blood-vessels, nerves, joints and bones, or the potential or actual cautery be applied to those parts." Kāçyapa is one of the ancient Hindū physicians. He is quoted in the Bower Manuscript (see my edition, p. 170, verse 1020) and in the Aṣṭāṅga Hṛdaya (VI, 2, verse 43). A Kāçyapa Saṁhitā still exists and the above quotation is probably from that work. I have no means of verifying it. NI. tries to reconcile the discrepancy by saying that Suçruta here only means to say that the cautery should be used to stop the flow of blood, when a blood-vessel or nerve, etc., is divided, but not, that it should be used to cure any disease of those parts; for the latter object is practically included in the cauterization of the muscles, as a bye-product of it, according to the saying of Madaçaunaka: "along with the cauterization of the muscles diseases seated in the blood-vessels, nerves, bones and joints are also relieved." This harmonization, however, seems untenable in view of Suçruta's direction in § [8], that cautery should be applied to the blood-vessels, nerves, joints and bones, as well as to the skin and muscles, in the case of a painful inflammation caused by the deranged air of the body. The reconciliation suggested by BHĀ. has more probability. It says: "the use of the negative phrase "cautery is not prohibited," instead of the positive "cautery

is cauterized, the burning is attended with a (crackling) noise, bad smell, and contraction of the skin. When the muscles are cauterized, (the burnt part assumes) the colour of a grey pigeon, is slightly swollen and painful, and its wound is dry and contracted. When blood-vessels and nerves are cauterized, the wound appears black and elevated, and the discharge is stopped. When joints and bones are cauterized, the burnt part becomes rough and red, and the wound is hard and solid. [7] In headache and ophthalmia the eyebrows, forehead, and temples should be cauterized. In diseases of the eyelids, the roots of the eyelashes should be cauterized, after protecting the eye with a piece of wetted cotton cloth.[181] In very painful affections, caused by deranged air, of the skin, muscles, blood-vessels, nerves, joints, or bones, in sores forming hard and insensible protuberances,[182] in cystic tumours, piles, tumours, fistula-in-ano, enlarged lymphatic glands, elephantiasis, condyloma, black moles, scrotal enlargements, and injuries to joints and blood-vessels the actual cautery should be applied. [8]

(5) Now, there are (four) different ways of performing the

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is enjoined," shows that cautery is only intended to be used in the case of a rapidly fatal disease of the blood-vessels, etc." In any case, it may be noted that though Suçruta permits the use of the actual cautery, he prohibits the employment of the potential cautery, in the case of diseases of blood-vessels, nerves, etc.; see § 5 of the 11th chapter.

[181] The text has *alaktaka*, which Nr. explains simply by *karpaṭa* or 'piece of cotton cloth.' Dr. U. C. Dutt says it is "cotton coloured red with lac."

[182] Dr. U. C. Dutt, in his translation takes this and the preceding phrase to signify but one disorder: "when a painful inflammation is caused by deranged air on the skin, flesh, etc., and the inflamed part is hard, swollen and insensible." But a "painful inflammation" could not at the same time be "insensible." Clearly two distinct disorders are referred to. This is also seen from Cakrapāṇidatta's remark that *vraṇa* is to be taken *sāmānya* or 'in a general sense,' and therefore not with any particular reference to deranged air. The latter term seems to indicate a different disorder: painful rheumatic affection.

actual cautery: namely, in circles, points, lines, and areas.[183] [9] Here comes in (the following verse):—

> When he has examined the place and form of the disease, as well as the vital parts and the strength or weakness of the patient, only then the physician should decide on carefully performing the actual cautery. [10]

After the part is thoroughly cauterized, it should be dressed with honey and clarified butter.

(6) Now the actual cautery may not be performed on the following persons: those who are of a bilious temperament, who are subject to internal hæmorrhage or diarrhœa, and who have unextracted foreign substances in their body, weak people, children, old and timid people, also those who are suffering from numerous ulcerations,[184] and those who cannot be made to perspire.[185] [11]

(7) We shall now proceed to describe the symptoms of cauterization when improperly performed. Fire is made a means of cauterization by being introduced into some oleaginous or dry substance.[186] But an oleaginous substance, if well heated by fire, will, by following the minute vessels of the body, penetrate into its skin and its other parts, and rapidly cauterize them. Hence in cauterization by an oleaginous substance there is a

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183 To suit the differences in the shape of the diseased part, as the commentaries explain. I follow the reading given in Gangāprasād Sēn's edition, which is also that of Bhā. and Ni. The latter, however, says that some add *rōg-ākṛtim=avēkṣya*, *i.e.*, 'with a view to the shape of the diseased part.' The reading of Vidyāsāgara's edition *rōg-adhisthāna-bhēdād=agnikarma caturdhā bhidyātē*, *i.e*, 'on account of the difference in the seats of the diseases the actual cautery is divided in four kinds,' is clearly a redundant interpolation.

184 Text: *anēka-vraṇa-pīḍita*. Bhā., however, reads *anēka-vyādhi-pīḍita*, *i.e.*, 'who suffer from various diseases,' that is, such diseases as are unsuitable for treatment by cautery, lest they be increased.

185 *E.g.*, those who suffer from morbid pallor, morbid micturition, morbid thirst, hæmorrhage, etc. So the commentaries.

186 *I.e.*, by strongly heating wood, stones, metals, etc., or, on the other hand, clarified butter, oil, etc.

greater amount of pain. [12] Now there are four grades of cauterization: scorching, deficient burning, proper burning, and over-burning. Scorching is that which merely results in a heavy discoloration (of the skin). Deficient burning is that where severe blisters arise with a sensation of drying up and burning up, combined with redness, suppuration, and pains, and take a long time to heal. Proper burning is that in which the burn is not too deep, coloured (yellow) like the (ripe) fruit of the Palmyra palm (*Borassus flabelliformis*), well-formed,[187] and furnished with all the characters previously [see § 4] described. Over-burning is that in which the flesh is pendulous, the body languid, the blood-vessels, nerves, joints and bones excessively injured, and fits of fever, burning sensation, thirst and fainting supervene; in which moreover the sore heals very slowly, and, even after healing, has an unhealthy colour. All these four kinds of cauterizations fulfill (for the physician) their own proper purpose.[188] [13] Here come in (the following verses):—

> Irritated by fire, the blood of living beings becomes greatly deranged; and its derangement quickly communicates itself to their bile. [14] For these two (substances) are like one another in regard to their (hot) power, their (bitter) taste and their (character as) elements (of the body). Hence severe pains arise: burning comes as a natural result (of the fire) [15]; blisters quickly spring up; and fever and thirst supervene.

(8) Now the treatment adapted to neutralise (the effects of) cauterisation is the following. [16] In the case of scorching, heat should be applied, and heating medicines administered, for, when the body copiously perspires, the blood becomes thin. [17] For cold water naturally thickens the blood. Hence heat gives relief, but never cold. [18] In the case of deficient burning, the physician should adopt both cold and hot treatments. Dressing with clarified butter and

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187 *I.e.*, neither too much raised, nor too much depressed. So the commentaries.

188 *I.e.*, they show him both what he should do, and what he must avoid. So the commentaries.

sprinkling with cold water should be resorted to by him. [19] In the case of proper burning a dressing made of (equal parts of) bamboo-manna, (bark of) Plakṣa (*Ficus Tjakela*), (red) sandal-wood, and Amṛta (*Tinospora cordifolia*), and greased with clarified butter, should be applied. [20] Also a plaster, made of the pounded flesh of animals living in villages, marshes or water,[189] may be applied. In fact, the treatment should be with enduringly heating medicines, the same as in the case of deep-seated abscesses caused by deranged bile. [21] In the case of over-burning all loose-hanging pieces of flesh should be removed, and a cooling treatment adopted by the physician; afterwards a plaster made of the grains of Çāli or 'cold-season-rice,' [22] or of the bark of Tindukī (*Diospyros Embryopteris*) or other trees with an astringent bark, mixed with clarified butter, should be applied; and the sore should be covered with leaves of Guḍūcī (*Tinospora cordifolia*) or of some water-plant. In fact, the physician should follow altogether the same treatment as in the case of erysipilas caused by deranged bile. [23] The following makes an excellent granulating agent for every kind of cauterized burns, namely a paste made of (equal parts of) wax, honey, (bark of) Lōdhra (*Symplocos racemosa*), resin of Sarja (*Shorea robusta*), madder, (red) sandalwood, and (leaves and root) of Mūrvā (*Sanseviera zeylanica*), powdered and boiled in clarified butter. [24] In cauterizations by (heated) oleaginous substances a dry method of treatment should preferentially be followed.

(9) We shall now proceed to describe the symptoms of suffocation by smoke. [25] (The patient) breathes and sneezes hard,[190] becomes distended with wind, and coughs; his eyes become burning and red; [26] his expirations are

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189 Such as horses, etc., boars, buffaloes, etc.; turtles, etc. So Ni.

190 The text has *kṣanti*, which Ni. explains by *hikkati* or 'he hiccoughs.' But the reference is to sneezing, as Dr. Dutt translates.

mixed with smoke; he can smell nothing else but smoke, nor can he recognize any tastes; his hearing also is impaired; [27] he is thirsty, hot and feverish; he sinks (under the treatment) and faints. Such is suffocation by smoke. Now hear its treatment. [28] The patient should be given clarified butter with the juice of sugarcane, or raisins with milk, or sugared water, or sweetened acid juices in order to cause him to vomit. [29] By vomiting the bowels are cleared, and the smell of the smoke disappears. By this treatment, the languor, sneezing, fever, [30] burning, fainting, thirst, flatulence, (difficulty of) breathing, and coughing are alleviated. The use of sweet, saline, acid and acrid gargles [31] restores the functions of the senses and revives (those of) the mind. Errhines, skilfully administered to the patient by the physician, [32] clear his sight and (relieve) his head and neck. A diet should be prescribed of articles which are not heating, easy of digestion, and oleaginous. [33] In cases of burns from hot winds or exposure to sun, a cooling treatment should always be adopted. Burns caused by exposure to icy cold or showery winds are alleviated by (the use of) heating and oleaginous substances. In the case, however, of a burn by lightening there is no chance of recovery.[191] [34]

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[191] The text has *atitējas*, lit. 'excessive burn,' which both BHĀ. and NI. explain to refer to lightening. BHĀ. in its comment, however, adds that "if only slighty burnt by lightning (*manāg-dagdha*), the patient may recover," and NI. supports this comment. This clearly let to the textual addition of verse [35], which is given in Jīvānanda's edition, and runs as follows: "but if the patient survives after being struck by lightening, he should be treated with oleaginous applications, washes and poultices." In Ḍallaṇa's time this addition already existed; but he says: "the commentaries (*nibandha*) do not acknowledge it. Cakrapāṇidatta did not read it in his text; and in Gaṇgāprasād Sēn's edition it is omitted. Instead of the usual recension *çīta-varṣ-ānilair* 'cold and showery winds,' I read, with Cakrapāṇidatta, *hima-varṣ-ānilair* 'icy cold and showery winds.' Ḍallaṇa who reads *çīta* explains it by the popular saying: "that *hima* or icy-cold burns like heat."

THE THIRTEENTH CHAPTER.

On the Application of Leeches.[192]

(1) Leeches may be said to be the mildest of all means for extracting blood, well adapted for princes, rich persons, children, old, timid and weak people, women, and delicate persons. [2]

(2) Blood deranged by air, bile, or phlegm may be extracted by horns, leeches, and gourds respectively, or any kind of deranged blood (may be extracted) by any (of the three); but if blood is to be extracted profusely, the horn, leech and gourd should be employed (in the order mentioned).[193] [3] Here come in (the following verses) :—

> The horns of cows are said to be heating, mild and unctuous;[194] hence they are the proper (instrument) for extracting blood in diseases caused by deranged air. [4] Leeches are born in water, have a cold exterior and are mild;[195] hence they are proper (to be used) for extracting

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[192] The commentaries explain that this chapter really treats of the various 'accessory instruments' for extracting blood. Of these leeches are the mildest, then come horns and gourds, and finally scarification and venesection, the last two being not 'mild' at all.

[193] I have adopted the reading of the text of Ḍallaṇa and Cakrapāṇidatta. It is also given in the edition of Gaṅgāprasād Sēn. According to Ḍallaṇa the concluding sentence was rejected by some commentators, including Jaïjhaṭa. It is also omitted in the editions of Jīvānanda and Avināça Candra. On the other hand, Jīvānanda's edition interpolates, after the first sentence, the words "by reason of their unctuous, cooling, and dry natures," which Ḍallaṇa says are rejected by all commentators, and they undoubtedly seem to be superfluous, seeing that their purport is stated in the succeeding verses [4–6].

[194] Bhā. reads *çlakṣṇaṁ* 'smooth' for *uṣṇaṁ* 'heating'

[195] Text *vāri-sambhava* 'born in water,' to distinguish them from *tṛṇa-jalaukā*, lit., 'grass-leech,' *i.e.*, a caterpillar. So Bhā. *Çīt-ādhivāsā* is explained by Ni. as *çīta-gṛhā* or 'living in cold places,' but by Bhā. as *çīta-sambaddhā*, which I have adopted. *Madhurā* is explained by Bhā. as 'mild in application.'

blood in diseases caused by deranged bile. [5] Gourds are said to be acrid, dry and pungent; hence they are the proper (instruments) for extracting blood in diseases caused by deranged phlegm.[196] [6]

Now in cupping, the blood should be extracted by means of a horn to which a small bladder is tied as a cover, after sucking it;[197] or by means of a gourd in the inside of which a burning wick is placed. [7]

(3) The leeches are called *jal-āyuka* because *jala* or 'water' is their *āyuḥ* or 'food;' and they are called *jal-aukasa* because water is their *ōkas* or 'dwelling place.' They are of twelve kinds: six of these are poisonous and just as many are non-poisonous.[198] The poisonous ones are (the following): *Kṛṣṇā, Karvurā, Alagardā, Indrāyudhā, Sāmudrikā* and *Gōcandanā*. Among these the *Kṛṣṇā* or 'black one' is of the colour of (black) collyrium and has a broad head. The *Karvara* or 'variegated one' is as

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196 According to Gaŋgāprasād Sēn, his Bombay copy adds here the following verse: *alāvv=aṣṭāŋgulaṁ vidyāt çṛŋgan=tu dvādaçāŋgulam, jalaukā ca harēd=raktaṁ çītā sarva-gataṁ nṛṇām* i.e., 'the gourd should be of the size of 8 aŋgula, and the horn, of 12; the cold leech draws the blood of men from any part.' Ḍallaṇa refers to this verse, though he does not quote it. But he quotes the following from an unnamed authority: 'the horn should be that of a white cow and should be of the size of seven aŋgula, and shaped like the disk of the moon; at the top there should be a hole of the size of a pea.' According to him, the gourd should measure 8 aŋgula (6 inches) in circumference, and 4 aŋgula (3 inches) in size. Cakrapāṇidatta's measures are: the horn should be 3 aŋgula, and its hole should be of the size of the stalk of an oleander flower. His measure for the gourd is not fully given.

197 The sucking, of course, creates a vacuum in the horn; so does the burning of the wick in the gourd. I read, with BHĀ. and NI., *vasti* or 'bladder.' Another reading, also mentioned by NI. and given in Jīvānanda's edition has *vastra* or 'piece of cloth.'

198 The commentaries state, that according to another text-book (*tantra*), not named by them, the poisonous leeches are of eight kinds.

long as an eel,[199] and has an abdomen, in some places raised, in others depressed.[200] The *Alagardā* looks as if covered with hair, has large sides and a black mouth. The *Indrāyudhā* or 'rainbow' is adorned with (longitudinal) lines on its back, of the colours of the rainbow. The *Sāmudrikā* or 'the stamped one' is of a slightly whitish-yellow colour and marked with flower-like spots of various forms. The *Gōcandanā* has a bifurcated tail resembling the scrotum of a bull, and a small mouth. If any person is bitten by these, their bite produces swelling and excessive itching of the part, and fainting, fever, heat, vomiting, delirium, and general collapse supervene. In such a case the *Mahāgada*[201] or 'Great Antidote' should be administered in the form of a potion or an ointment or an errhine or in any other form. The bite of an *Indrāyudhā* is incurable. So far the poisonous leeches and the treatment (of their bite) have been described. [8] Now the non-poisonous leeches are the following: *Kapilā, Piŋgalā, Çaŋku-mukhī, Mūṣikā, Puṇḍarīka-mukhī, Sāvarikā.* Among these the *Kapilā* or 'the greenish one' has its two sides of the colour of orpiment, and on its back it is smooth and of the colour of a (green) pea.[202] The *Piŋgalā* or 'tawny

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199 The original has *varmi-matsya* or 'Varmi fish.' The Hindū medical dictionaries explain it as a "kind of river fish," and say that in the vernaculars it is called *vāṇi* or *vāni* or *vāin* or *vān* (Baŋgālī) and *bāmbī* or *bām* (Hindī). This is the name of the eel. The Petersburg Dictionary does not identify it. Ni says that it is "like a snake," but it adds that some identify it with the Rōhita fish, which is a kind of carp. The comparison with an eel would indicate a rather long species of leech.

200 *I.e.*, probably, as Dr. U. C. Dutt paraphrases it, "it has elevated stripes across its abdomen"; but not, as Dr. Wise puts it in his Hindu System of Medicine, p. 177, that "it moves irregularly."

201 This antidote will be found described *infra*, in verses [59–61] of chapter V of the Kalpasthāna (or 5th Section).

202 *Kapilā* is somewhat puzzling. It cannot have here the usual meaning of 'brown' or 'tawny,' because the commentaries explain the following *piŋgalā* by *kapilā*. Of Mudga (*Phaseolus*

one' is of a reddish-brown colour and a round body and moves quickly. The *Çaŋku-mukhī* is (bluish-red) of the colour of liver, sucks quickly, and has a long sharp mouth. The *Mūṣikā* or 'rat-like one' has the shape and colour of a rat's (tail)[203] and is of a disagreeable smell. The *Puṇḍarīka-mukhī* or 'lotus-faced one' is of the colour of a (green) pea,[202] and has a mouth like the lotus. The *Sāvarikā* is slimy, (green-)coloured like a lotus-leaf, and eight aŋgulas (or 6 inches) in length; it is only fit for extracting blood from animals. Such is the description of the non-poisonous (leeches). The countries in which they occur are the Yavana, Pāṇḍya, Sahya, Pautana and others.[204] The leeches found in these countries are large-bodied, and strong, suck (blood) quickly and eat much, and are specially free from poison. Those leeches which are produced in dirty water and from the decomposition of poisonous fishes, insects, frogs, urine, and fœces are poisonous. Those which are produced in pure water and from the decomposition of the various kinds of lotus, called *Padma, Utpala, Nalīna, Kumuda, Saugandhika, Kuvalaya, Puṇḍarīka,*[205] and of *Çaivāla*

Mungo) there are two kinds: green and yellow. Cakrapāṇidatta says that the *harita-mudga* or 'green pea' is intended; and *harita* is also a synonym of *kapila*. The latter is an undecided colour.

[203] Só.Bhā.: it is like the tail of a rat on account of its length.

[204] According to Ḍallaṇa, by *Yauvana* is meant the country of the *Turuṣka* (*i.e.*, the trans-Indus country); by *Pāṇḍya*, the Dekkan or Southern India, by *Sahya*, the country about the Narbadā or Central India, and by *Pautana*, the country about Mathurā or Western India. Both Ḍallaṇa and Cakrapāṇidatta state that some commentators reject this passage; but in that case they would have to read, in the following sentence, *tāsu* instead of *tēṣu*, in order to make it applicable to the feminine *jalaukā*, 'a leech.' The neuter *tēṣu* refers to *kṣētrāṇi* and clearly presupposes the existence of the passage in question.

[205] All these are different varieties of *Nelumbium speciosum* and *Nymphaea lotus*. According to Ḍallaṇa, "*Padma* is whitish, and *Puṇḍarīka*, very white; *Nalīna* is reddish and *Kuvalaya*, red; *Utpala* is bluish; *Saugandhika* is very sweet-scented and opens in moonlight; *Kumuda* is the well-known vernacular *Kuiyā* or *Kōī*." The two last-mentioned are white varieties.

(*Blyxa Octandra*) are non-poisonous. [9] Here comes in (the following verse) :—

> These beneficial (leeches) have their habitat in meadows and fresh waters; they do not live in confined places, nor do they lie in quagmires. [10]

As to the means of securing them, they may be caught with (a piece of) wet leather, or with some other (suitable) article.[206] They should then be kept in a new large earthen pot, filled with mud and water from a pond or lake. For food, they should be given of the green fungi growing on stagnant water, dried meat, and powdered tubers of aquatic plants; and for bedding, grasses and leaves of water-plants. Every second or third day, fresh water and food should be given, and every week the earthen pot should be changed. [11] Here comes in (the following verse) :—

> Leeches the middle of which is thick, or which are exhausted, or are expanded, or which move slowly, or do not fix, or suck little, or which are poisonous, should not be selected (for use). [12]

(4) When about to apply a leech to a person who has got a disease curable by them, the patient should be made to lie down, and the (affected) part, if free from ulcers,[207] should be rubbed dry with powdered cowdung and earth. Then having taken hold of the leech, and irritated its body with (a mixture of) turmeric and mustard rubbed into a paste with water, it should be placed, for a little while, in a cup of water, till its dullness is seen to have passed off;[208] and then it may be applied to the

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206 *E.g.*, a piece of freshly killed meat, or one's leg smeared with butter, or milk, etc. So the commentaries.

207 Because, otherwise, by rubbing the ulcers the disease will be increased; or else it sucks the ulcer, attracted by the wet and smell of the blood. So the commentaries.

208 The usual text has *vigata-klama* 'freed from dulness'; but Cakrapāṇidatta reads *vigata-mala* which he explains by *apagata-vāhya-mala*, 'freed from external impurities.' Both readings make good sense. The leeches are smeared with the paste to excite them, and they are put in water to clean them again from the paste, before applying them.

diseased part, covering it with a fine white wet piece of cotton-cloth, but so as to leave its mouth free. If it does not fix quickly, a drop of milk or a drop of blood may be applied to, or a small incision may be made (in the deceased part). If even then it does not fix, another should be applied. When it fastens on (the part), a leech raises its shoulder and bends its head like a horse-shoe, then it may be known to be sucking; and while it is thus sucking, it should be covered up with a wet cloth. If in the bitten part itching or pain is felt, it is a sign that the leech is drawing pure blood; and such a leech should be removed. If on account of its scenting the blood,[309] it will not let go, it should be bestrewed with powdered rock-salt. When it now falls off, its body should be irritated with powdered rice and its mouth smeared with oil and salt; then taking hold of it by its tail with two fingers of the left hand, its body should be slowly and gradually pressed with the thumb and index-finger of the right hand, (from the tail) towards the head, and thus it should be made to vomit, until it is thoroughly emptied. When it is thoroughly emptied and placed in a cup of water, it goes about in it in search of food. If it sinks (to the bottom) and does not move about, it is not quite emptied, and should again be made to vomit till it is thoroughly empty. A leech which has been insufficiently emptied, is attacked with an incurable disease called *Indramada*.[310] A leech which has been completely emptied should be replaced, as before explained, (in the earthen vessel). According as the (quantity of) blood (drawn) is proper or improper, the leech-bites should either (in the former case) be rubbed with honey, or sprinkled with cold water and bandaged, or (in the latter case) the wound may be also poulticed with

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309 The usual reading is *çōṇita-gandhēna* 'by the smelling of blood,' but according to Ḍallaṇa some substitute *çōṇita-gardhēna* 'through greed for blood,' on the ground that leeches have got no sense of smell.

310 According to the commentaries some reject this passage, on the ground that the nature of the *Indramada* disease is not explained in any medical text-book. Cakrapāṇidatta himself would seem to have been in favour of rejecting it.

cooling poultices made of astringent or sweet drugs mixed with clarified butter.[211] [13] Here comes in (the following verse) :—

> Whoso knows (all about) the leeches, their habitat, the mode of catching them, their varieties, and the manner of keeping and applying them, he is able to overcome all diseases curable by them. [14]

THE FOURTEENTH CHAPTER.

DESCRIPTION OF THE BLOOD. [1]

(1) Food, which is derived from the five (primary) elements, is of four kinds, and possesses six tastes, two or (according to others) eight sensific powers, and many other qualities,[212] yields, if

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[211] This is the interpretation given by some commentators, according to Ḍallaṇa and Cakrapāṇidatta. It is also adopted by Dr. U. C. Dutt, though in a slightly and incorrectly modified form. It seems to me to be the only admissible one: two alternative blood-effusions are mentioned, and the treatment adapted to each. Ḍallaṇa and Cakrapāṇidatta themselves, however, prefer another interpretation with a fourfold division. According to them *ayōga* is of three kinds: *hīna*, *ati* and *mithyā*. Rubbing with honey is intended for *hīna-yōga* or 'insufficient extraction,' sprinkling with water and bandaging for *atiyōga* or 'excessive extraction,' and dressing with poultices for *mithyā-yōga* or 'imperfect extraction' (*i.e.*, when impure blood is left in the wound). This interpretation, however, leaves no treatment indicated for *yōga* or 'proper extraction.' Hence those commentators add, out of their own head, that it should be treated by *dhauta-ghṛt-ābhyaṅga*, *i.e.*, 'dressing with well-washed clarified butter.'

[212] On the five (primary) elements see notes 16 and 30. The four kinds of food are those which must be drunk (*pēya*), licked (*lēhya*), swallowed (*açita* or *bhōjya*), and masticated (*bhakṣya* or *khādita*). On the tastes, sensific powers, and other qualities, see *infra*, chapters 40–42. By the other qualities are especially meant those of light (*laghu*) and heavy (*guru*) digestion; so BHĀ. Altogether twenty *guṇa* or 'qualities' are counted.

it is suitably taken and thoroughly digested, its clarified[213] essence (as a fluid substance) of very great fineness, which is called *rasa* or 'chyle.' The seat (of this chyle) is the heart, which is purified thereby.[214] Then proceeding from the heart, through the twenty-four *dhamani*-vessels, ten ascending, ten descending, and four transverse, it, day by day, satiates the whole body, increasing, maintaining, and strengthening it, by some mysterious manner of action.[215] From the fact that it pervades the whole body it can be further inferred that its condition is liable to the ills of deficiency and excess.[216] Seeing that this chyle pervades the

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[213] The term *tējōbhūta* is explained in three different ways. Cakrapāṇidatta says it means 'pure' (*nirmala* or *prasanna*), and he quotes Caraka in support. But he allows the optional meaning *ghṛta-vad=utpanna* 'produced like clarified butter from butter,' *tējas* being a synonym of *ghṛta*. Ḍallaṇa also allows the latter; but he prefers the meaning *vahni-sambhūta* or 'produced by fire' (*i e.*, the digestive fire).

[214] The heart is also said to be the seat of *ōjas* or 'vital force.' Hence Ḍallaṇa says that here by 'heart' is to be understood not the heart itself but its region, while Cakrapāṇidatta says that the seat of blood is that portion of the heart which is not occupied by *ōjas* as its seat. On *ōjas* see the next chapter. I read, with BHĀ., *yach=chhuddhaṁ* after *sthānaṁ*.

[215] The terms 'increasing,' 'maintaining' (*dhārayati* or as some read *jīvayati*), and 'strengthening' refer respectively to youth, middle age, and old age. So the commentaries.

[216] I.e., *rasa* or 'chyle' pervades the whole body, seeing that, being healthy (*tējōbhūta*) itself, it keeps the body in a healthy state (*tējas*), as explained in the preceding passage. But the body is not always healthy; it is subject to diseases; hence it follows that the *rasa* itself must be subject to ills. This seems to me the correct construction of the passage, and its obvious meaning as intended by Suçruta. The commentators, however, give an entirely different construction and interpretation of it. They construe thus: *tasya anusaratō gatir=anumānād=upalakṣitavyā kṣaya-vṛddhi-vaikṛtaiḥ*; and interpret thus: 'The fact of the chyle pervading the body can be inferred from its ills of deficiency and excess (and the consequent diseases of the body).' But why should the latter be a

whole body, its limbs, humours, constituent parts,[217] secretions, and receptacles,[218] the question arises,[219] is this substance

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proof of the prevalence of the chyle throughout the body, any more or any better than the health of the body? In fact this proof is already given by Suçruta in the preceding passage: it is the health of the body which proves that the chyle which is also a healthy substance pervades the body. But there remains a difficulty which Suçruta had clearly to answer. If the prevalence of the healthy chyle makes the body healthy, how are the diseases of the body to be accounted for? The answer is: that the chyle, though essentially a healthy substance, is subject to deficiency or excess. Moreover the very term *upalakṣitavyā* indicates that some additional mark of the chyle is referred to; its health is previously spoken of, now its drawbacks are noted. Ḍallaṇa evidently felt this difficulty, for he suggests that *ca* 'and' must be understood (*draṣṭavya*) with *kṣayā-vṛddhi-vaikṛtaiḥ*. But this would be not only a gratuitous addition, but the awkwardness of his construction of *anumānāt* still remains. The diseases of the body consequent on the ills of the chyle are exemplified by Ḍallaṇa thus: deficiency of chyle causes pains and palpitation of the heart, etc., excess of it, languor of the heart, etc.—It may be also noted, that all modern editions read: *çarīram=anudhāvatō* or 'flowing through the body,' while both Ḍallaṇa and Cakrapāṇidatta read *çarīram=anusaratō*. This is clearly the older reading which I have adopted. It may mean the same as *anudhāvatō* 'flowing' or 'moving,' but not necessarily; it may also simply mean 'pervading' (as, as a matter of fact, it does mean in the immediately following passage), and in the original context of Suçruta, as I have adopted it from Cakrapāṇidatta, neither he nor Suçruta can have meant anything else by it. The whole context only further proves the well-known fact, that in Cakrapāṇidatta's time and before it the circulation of blood (*i.e.*, chyle reddened) was not yet known. The substitution, in the context, of the explicit term *anudhāvatō* would seem to have been a resultant of the spread of that knowledge into India.

217 The *dhātu* or 'constituent parts' (or secondary elements) of the body are seven; see below § [6], and *ante*, footnote 30.

218 On these parts of the body see the 5th chapter of the Çarīra-sthāna (or 3rd Section), also the next paragraph of the present chapter. Secretions include both excreta and secreta.

219 That question arises in this way: of the parts of the body

a cooling or a heating one. The answer is this: chyle is indeed an all-pervading substance,[220] but from the fact of its being a lubricating, vitalizing, nourishing, and preserving agent, it may be concluded to be a cooling one.

(2) Now this chyle, though originally a watery fluid, assumes a red colour by contact with (the bile situated in) the liver and spleen. [1] There are also (the following two verses):—

> Now this watery fluid, which (in itself) is devoid of any colour, is reddened through the heating power (of the bile) present in the body of corporeal beings in a healthy state, and it is hence called *rakta* or 'blood' (lit. the red substance). [2] From this same chyle also the so-called *rajas* or 'menstrual blood' of women is derived; this blood begins to appear at the age of twelve and comes to an end at the age of fifty.[221] [3]

That the menstrual blood, however, has the property of heat may be seen from the fact that the womb has both the properties of heat and cold.[222] Other (medical) authorities add that the blood of living beings is (ultimately) composed of the five elements; [4]

> for (they say) the smell of raw meat, liquidity, red colour, tendency to ooze, and lightness, which are the

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some are cold, as phlegm, others are hot, as bile; but chyle pervades all; is it, then, cold or hot? So the commentaries.

[220] I read only *anusārī* with Ni. and Bhā. The reading *dravānusārī*, lit. 'flowing pervader,' is an emendation due to the same cause as the reading *anudhāvatō*, see note 216.

[221] For the third verse, Ḍallaṇa mentions the following curious reading, unknown to Cakrapāṇidatta: *rasād=ēva rajas=strīṇāṁ māsi māsi try-ahaṁ dravēt* । *tad=varṣād=dvādaçād=ūrdhvaṁ yāvat=pañcāsataṁ samāḥ* ॥ *i.e.*, 'from this same chyle flows the menstrual blood of women, month by month, for three days, beginning from the age of twelve up to that fifty years.'

[222] The meaning is this: it is well-known that the womb, into which both the semen and the menstrual blood enter, possesses both the hot and cold properties. Now the semen is cold, and accounts for the cold property of the womb. It follows hence

five qualities of earth and the other (four elements respectively), are also observable in the blood. [5] (Further,) blood being produced from chyle, flesh is next produced from blood, fat from flesh, bones from fat, marrow from bones, and (lastly) semen from marrow. [6] Thus chyle, being itself the essence of food and drink, nourishes these (other six) *dhātu* or 'constituent parts of the body.'[223] [7]

(3) Now the root *ras* means 'to go'; and the *dhātu* or 'constituent part' *rasa* or 'chyle' is called so, because it moves continually. But it stays in each of the (other six) constituent parts (of the body) for the space of three thousand and fifteen kalā. Hence it takes the chyle one month to turn into semen, or, in the case of women, into menstrual blood.[224] [9] Hereon comes in (the following verse) :—

Hence the total period is stated, in this (*i.e.*, the author's own) as well as in other text-books, to be eighteen thousand and ninety (18090) kalā. [10]

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that the menstrual blood must be hot, in order to account for the hot quality of the womb. The ordinary blood is neither hot nor cold, for it is the joint product from the cold chyle and the heating bile, see §§ [1, 2]. So Cakrapāṇidatta; but Ḍallaṇa, who reads *ārthavaṁ çōṇitañ=ca*, *i.e.*, 'the menstrual blood as well as the ordinary blood,' holds that both kinds of blood are hot, the heat of the ordinary blood being inevitably involved in that of the menstrual blood.

[223] Jīvānanda's edition here inserts the following verse [8]: "hence one should remember that man is the product of chyle, and, as a prudent man, preserve the chyle by careful attention to food and drink and ways of living." Neither Ḍallaṇa nor Cakrāpaṇidatta had it in their copies of Suçruta.

[224] See *ante*, footnote 84. The calculation, according to BHĀ, is as follows: 30 *kāṣṭā* make one *kalā*; 20 *kalā* and 3 *kāṣṭā* (or 20 $\frac{1}{10}$ *kalā*) make one *muhūrtta*; and 30 *mahūrtta* make one *ahōrātrā* or 'day of 24 hours.' Accordingly ($20\frac{1}{10} \times 30$ or) 603 *kalā* make one day. Now chyle takes 5 days or (603×5 or) 3015 *kalā* for each of its six successive transmutations (into blood, flesh, fat, bones, marrow, and semen or ova in the menstrual blood). Accord-

This chyle pervades the whole body by a very subtle process, after the manner of the diffusion of sound, light and water.

(4) Aphrodisiac medicines, when administered, act like (other) secretory agents,[225] and cause, by dint of their own power and properties, the rapid secretion of semen. [11] Just as with regard to the bud of a flower one cannot say that there is any scent, nor that there is no scent; yet, considering that the true state of things is not yet perceptible, (it must be so that) there is scent; only, on account of its slightness, it cannot be perceived, but after a time, with the expansion of the petals and stamens, the scent is clearly perceived. Even so, with the advance of age, the semen of boys makes its appearance; so do the lines of hair (on the body) and the other signs of puberty, as

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ingly it takes one month or (3015×6 or) 18090 *kalā* (see § [10]) for the entire series of transmutations. One *kalā* = 2 minutes and $23\frac{57}{201}$ seconds; accordingly 3015 *kalā* = 5 days. BHĀ. mentions, however, also another theory. According to it, the period of transmutation varies: 6 days or 12 days or one month, according to the state of the digestion. BHĀ. further suggests: that this variation is intended to be expressed by the comparison of the process of transmutation to the diffusion of sound, light and water (see § [11]). These three things move with different degrees of velocity, and thus indicate three different degrees of rapidity of digestion. Light is most rapid and signifies *tīkṣṇa* or 'brisk' digestion; sound is less rapid and signifies *madhya* or 'middling' digestion; water is the slowest and signifies *manda* or 'slow' digestion. NI. objects to this interpretation as untenable, saying that sound, light and water signify the transverse, upward and downward transmission of the chyle through the body. Neither interpretation, however, is probable; the comparison with sound, light and water seems to me only intended to convey the same idea as the phrase 'by some mysterions manner of action' in § 1, p. 88.—By *ārttava* is here meant *strīṇāṁ çukra* or 'the semen of women,' *i.e.*, ova as excreted with the menstrual blood. So the commentaries.

[225] The original has *virēcana*, which is the usual term for purgatives, but in *çirō-virēcana* the word is used in its more general sense of a secretory agent.

well as menstruation and the other marks of womanhood; and with the development of menstruation, an enlargement of the breasts, the womb, and the genitals takes place. Similarly, by reason of the body decaying through old age, chyle ceases to be a fostering agent for old people.

(5) The above-mentioned [§ [6]] (seven) *dhātu* or 'constituent parts of the body' are called so because they make up the constitution of the body. Their growth and decay depends upon the blood. Hence we will now expound the subject of the blood. [12] When it is vitiated by air, blood is frothy, tawny, dark, thin, flows quickly and is indisposed to thicken.[226] When it is vitiated by bile, it looks blue, yellow, green, and livid, smells like raw flesh, is not affected by ants and flies, and is indisposed to thicken. When it is vitiated by phlegm, it looks (pale) like a solution of red ochre, is oily, cool, thick, sticky, flows slowly and has the appearance of muscles. When it is vitiated by all three humours in combination, it has all the (above-mentioned) marks, and in addition it looks like *kāñjikā* or 'fermented rice-water' and has a foul smell.[227] When the blood is vitiated by any two humours at one time, it has the mixed characters (of blood deranged by those two humours).[228] [13] When blood is in its natural (healthy) condition, it may be known from the fact of its showing the red colour of the cochineal insect, and of its being not thick nor in any way discoloured.

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226 The original has *askandi*, which BHĀ. explains by *asaṁhata* or 'not thickened,' and NI. by *styānatva-rahita* or 'without thickness.' Dr. U. C. Dutt translates it "dries slowly," and Dr. Wise has "draws slowly," which practically express the idea.

227 Here Jīvānanda's edition inserts: "when the blood (of one part) is vitiated by the vitiated blood (of another part), it has the same marks as blood vitiated by bile and, in addition, is very black." Both BHĀ. and NI. notice this reading, but do not approve it.

228 Jīvānanda's edition here inserts: "of the blood of living beings we will speak elsewhere." BHĀ. knows nothing of this reading. NI. notices it only to reject it. It does certainly seem to be out of place.

(6) Diseases which require blood-letting will be described elsewhere.[229] Cases in which blood should not be extracted are swelling due to general anasarca or, in the case of a wasted male,[230] to the eating of acids, and inflammatory swellings connected with morbid pallor, piles, abdominal enlargement, consumption, and pregnancy. [14].

(7) There are two modes of extracting blood by means of *çastra* or 'cutting instruments' [see Chapter viii] : scarification and venesection. In making these, the instrument should be inserted with a quick movement and so as to avoid injuring any vital part, blood-vessel, nerve and joint, and the punctures (thus made) should be straight downwards, not too close together, very fine, in a straight line, not too deep, nor too superficial.[231] When the operation is badly done, or done on an inauspicious or on a cold and rainy day, on a patient whose perspiration is checked (by the chill) or who has not had his meal, the blood, by reason of being thick, does not come out freely or does not come out at all. [15] Here comes in (the following verse) :—

> In the case of persons who are suffering from intoxication, fainting, or fatigue, or are troubled with retention of urine, fæces and wind, or are overcome with sleep, or are timid, the blood does not flow freely. [16]

Vitiated blood, when it remains unextracted, causes itching,

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229 *I.e.*, in Chapter xxv, on the Eight Kinds of Surgical Operations. So the commentaries.

230 The original has *kṣīṇasya*, which might have a more general meaning; but NI. qualifies it with *puṁsaḥ*, 'of a male,' which seems to refer the word to 'wasted virility.'

231 These directions refer to both scarification and venesection; so BHĀ.; but NI. appears to refer them only to scarification, and this view has been adopted by Dr. U. C. Dutt. But BHĀ. is undoubtedly correct. BHĀ. explains that blood-letting by means of *anuçastra* or 'accessory cutting instruments' having been described in chapter xiii, now blood-letting by *çastra* or 'cutting instruments' is described. It further refers to Chapter viii, § 3 with respect to the mode of holding the instrument (*e.g.*, the *kuṭhārikā*).

swelling, redness, burning, suppuration, and pain. On a hot day, when a patient perspires much, or if the puncturing is overdone by an ignorant operator, the flow of blood becomes excessive. From such a discharge severe pains in the head, dimness of sight, ophthalmia, cataract, wasting of tissues, convulsions, hemiplegia, paralysis of a single limb, morbid thirst, burning, hiccough, cough, asthma, anæmia, and even death ensue. [17] Here come in (the following verses) :—

> Hence the physician should not extract blood either on a cold or a very hot day, nor from a patient who is either chilled or very heated, and he should operate on him after having given him repeatedly some gruel.[232] [18] When, after flowing (some time), the blood shows a proper red colour and stops of its own accord, then the physician may know that the blood is purified and that the bleeding has been properly done. [19] (Further) symptoms of a bleeding properly performed are (a feeling of) lightness, relief of pain, a check to the progress of the disease, and cheerfulness of mind. [20] Those who are in the habit of having their blood extracted periodically are never subject to skin-diseases, varicose enlargements, swellings, and (other) diseases due to (disordered) blood.[233] [21]

(8) If the blood does not flow freely, any three or four of the under-mentioned ingredients, or all of them together, just as they may be available, should be reduced to powder, worked up into a paste with mustard-oil and salt,[234] and rubbed on the

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[232] This according to NI., should be *tila-yavāgū* or 'gruel made of sesamum seed;' or according to BHĀ., *tila-taṇḍula-yavāgū* or 'gruel of sesamum and rice.' But NI. adds that according to others *virala-dravā* is intended, which is a gruel of any grain made with clarified butter. According to the commentaries the patient should have two or three meals of gruel, before being bled. The object of this is to warm up his system and thus induce the flow of blood.

[233] Such as deep-seated abscesses, erysipilas, etc. So NI.

[234] NI. reads here *lavaṇa-taila-pragāḍhair*, i.e., 'made into a paste with salt and sesamum-oil.' The reading of BHĀ. is not apparent.

scarified part, whereupon the blood will flow freely :—

Ēlā	*Elettaria Cardamomum* (cardamoms).
Çīta-çiva	*Cinnamomum Camphora* (camphor).
Kuṣṭha	*Saussurea Lappa.*
Tagara	*Tabernæmontana coronaria.*
Pāṭhā	(Roots of) *Stephania hernandifolia.*
Bhadra-dāru	*Cedrus Deodara* (deodar).
Viḍaŋga	*Embelia Ribes* (baberang).
Citraka	*Plumbago zeylanica* (plumbago-root).
Tri-kaṭuka	The three acrids, ginger, long pepper and black pepper.
Āgāra-dhūma	Soot.
Haridrā	*Curcuma longa* (turmeric).
Ārk-āŋkura	Shoots of *Calotropis gigantea.*
Naktamālā-phala.	Seeds of *Pongamia glabra.*

(9) If the blood flows too freely powders of the under-mentioned drugs should be sprinkled slowly over the scarified part and pressed into it with the point of a finger :—

Rōdhra	*Symplocos racemosa.*
Madhuka	*Glycyrrhiza glabra* (liquorice).
Priyaŋgu	*Aglaia Roxburghiana.*
Pattaŋga	*Caesalpinia Sappan.*[235]
Gairika	Red ochre.
Sarja-rasa	Resin of *Shorea robusta.*
Rasāñjana	Extract of *Berberis asiatica.*
Çālmalī-puṣpa	Flowers of *Bombax malabaricum.*
Çaŋkha	Conch-shell.
Çukti	Bivalve-shell.

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[235] NI. describes this as *rakta-candana* or 'red sandal,' which would be *Pterocarpus santalinus.* BHĀ. describes it as *ku-candana* or 'inferior sandal,' which is probably the Sappan-wood. This wood is whitish when freshly cut, but becomes red from exposure to air. It is by some Sanskrit writers included among the different kinds of sandal-wood, and is described as being of use to heal wounds and stop hæmorrhage. See Pharmacographia Indica, Vol. I, page 500.

Māṣa	*Phaseolus Roxburghii.*
Yava	Barley.
Gōdhūma	Wheat.

Or powders of the following drugs may be taken :—

Sāla and Sarja	Two varieties of *Shorea robusta.*[286]
Arjuna	*Terminalia Arjuna.*
Arimēda	*Acacia Farnesiana.*
Mēṣaçṛŋga	*Gymnema sylvestre.*
Dhava	*Anogeissus latifolia.*[287]
Dhanvana	*Grewia tiliæfolia.*
Tvaca	Cinnamon-bark.

Or one may take for the purpose (the ashes) of burnt linen, or powders of cuttle-fish bone or of lac. This done, the wound should be firmly tied with (linen or woolen) bandages as prescribed [in Chapter xviii]. The patient should, then, be covered with cool clothes, given cooling food, and kept in a cool room; he should also be treated with cool douches and poultices. (Failing the above-described modes) the wound should be burned with caustics or with fire; or the vein which gives off a too copious flow, should be divided at a place below the original incision[288] (and then cauterised).

(10) (After the operation) the patient should be given to drink a decoction of the Kākōlī class of drugs [see Chapter xxxviii, §[31]], or a sweet mixture of sugar and honey. Or he should take the blood of an antelope, deer, ram, hare, buffalo or boar, mixed with milk or pulse-soup or meat-broth, and well greased (with clarified butter). Any complications (that may arise from excessive loss of blood [see above § [17]] must receive that

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[286] This is the explanation of Ni. The resin of those trees is to be taken.

[287] Neither Bhā. nor Ni. explain this name. They do not seem to have had it in their copies of Suçruta.

[288] The original has *yathōkta-vyadhanād=anantaram*, lit. 'after the previously described incision.' Ni. explains it by *prāk-kṛta-vyadhanād=adhaḥ-sthānē*, lit. 'at a place below the previously made incision.' Bhā. does not explain it. Dr. U. C. Dutt, in his translation, omits it.

treatment which is suitable to the particular case. [22] Here come in (the following verses) :—

After any extraction of blood, owing to the loss in that constituent part (of the body), the patient's digestion becomes weakened, and his air becomes much deranged. Hence he should be very carefully [23] kept on such a diet as promotes the generation of blood, and which should consist of not-very-cooling, light, oleaginous articles, slightly acid or not acid at all. [24].

(11) There are four modes of arresting hæmorrhage: contraction (of the wound), thickening (of the blood), desicating, and cauterising. [25] Astringent (decoctions[339]) contract the wound; great cold thickens the blood; ashes [see § 9] dry up the wound; and cautery causes the veins to shrink. [26] If the blood refuses to thicken (by the application of cold), astringents should be applied; if these fail, ashes should be used. [27] By means of these three modes the physician should endeavour to the best of his power (to stop the bleeding); but if they all fail of success, cautery may be resorted to as an absolutely effective means. [28] If after bleeding any impure blood still remains (in the system), the disease will not increase much; in such a case, (the physician) should rest content (with the ordinary modes of depuration[340]) and not proceed to violent measures (of repeated bleedings). [29] (For) the blood is the root of the body, and it is the blood by which it is sustained. It should, therefore, be most carefully preserved; for it is the basis of life. [30] If through the cold applications [see § 9] used to stop the bleeding, the air becomes deranged, and (in consequence) the (scarified) part becomes painfully swollen, it should be treated with applications of tepid clarified butter. [31].

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339 Ni. instances the chebulic myrobalan, and the root-bark of the so-called *pañca-valkala* trees, see notes 70 and 107; also Pharmacographia Indica, Vol. III, p. 339.

340 Such as purgatives, emetics, etc.